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CLAIMS

[Claim(s)]
1. In growth equipment in a blood vessel with a wall which forms a lumen in the living body, they are a proximal edge and a distal end. And a 1st elongated tube-like member provided with a longitudinal direction axis, distance of this 1st elongated tube-like member an extension member which is supported by end and can move between a contraction position and an extended position -- an owner -- By carrying out. this extension member has the specified shape in an extended position -- an extension member -- a wrap -- deformable A film, [have and] This deformable film can be located on an extension member and in the bottom in an extended position. It has ** size, and is supported by proximal edge of a 1st elongated tube-like member, and they are a contraction position and **. A disposition means operated by people's hand in order to control movement of an extension member between tension positions Growth equipment having further.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
Growth equipment used for the blood vessel and pipeline of a human body, a tension giving device used for this device, and method Applications concerned are U.S. patent application 08th dated February 11, 1997 / continuation-in-part application of No. 798,870.
This invention relates to the tension giving device used for the growth equipment used for the blood vessel way and non-blood vessel way of a human body, and this and a method, and the method of performing endermic closing of the blood vessel access part of a human body in more detail.
Endermic access to the blood vessel and organ of a human body for sick diagnosis and a therapy has so far been performed. Endermic vascular surgery including a coronary circulation system, a peripheral vascular system, and a cerebrum blood circulatory system is performed. Coronary as these operations, and the angiography, the angioplasty and the atherectomy (atherectomies) of a peripheral vessel, There is an operation of back inflow (retroperfusion) of a coronary circulation system and back pouring (retroinfusion), cerebrum angiography, a fit, a cerebral-arteries phyma, etc. The patient who undergoes these operations is often treated with the antiplatelet agent and anticoagulant which combined heparin, thrombolysis medicine, or these, all these drugs bar coagulation, and it is made difficult that the body carries out the seal of the site of puncture. Although the device and method of former versatility have been used, any device and method also have a defect in which a complicated device and method are used. It is also difficult to obtain a good seal. Therefore, the device and method of canceling the device of conventional technology and the defect of a method of performing other endermic accesses and blockades to a blood vessel access part, a site of puncture, and a living body pipeline of a human body are demanded.
Widely, the purpose of this invention is the closing appliance and method of performing other endermic accesses and blockades to a blood vessel access part, a site of puncture, and a living body pipeline of a human body, and the certain seal of a site of puncture or a puncture pipeline is possible for it, It is in providing the closing appliance and method of promoting quick recovery of a site of puncture or a puncture pipeline.
Other purposes of this invention are to provide the closing appliance and method with the above-mentioned feature of using it with reliability easily.
Other purposes of this invention are to provide the closing appliance and method of having the above-mentioned feature in a site of puncture or a living body pipeline about introducing biological sealant.
Other purposes of this invention are to provide a closing appliance and a method with the above-mentioned feature of composition of that the small opening which can fully carry out a seal by biological sealant is left behind after removal of a closing appliance.
Other purposes of this invention are to provide the closing appliance and method of having the above-mentioned feature which makes possible the continuation blood flow which is not barred substantially during disposition of a closing appliance, and use.
Other purposes of this invention are to provide the closing appliance and method of having the above-mentioned feature which does not make any foreign matters remain in a blood vessel.

Other purposes of this invention are to provide the closing appliance and method with the above-mentioned feature of making early rising possible and avoiding **** over a long period of time.
Other purposes of this invention are to provide a closing appliance and a method with the above-mentioned feature without the thrombosis by bleeding, formation of the arteriovenous fistula, formation of the pseudoaneurysm, and distance embolization, and the danger of infection.
Other purposes of this invention are to provide a closing appliance and a method with the above-mentioned feature without a risk of causing the ischemia of the limbs.
Other purposes of this invention are cheap and there are in providing quickness, a closing appliance with the above-mentioned feature which can be used safely and easily and can be thrown away, and a method.
Other purposes of this invention have the shape of an extended assembly in providing growth equipment and a method with the above-mentioned feature of composition of being determined by the mechanical offset power of an extension member and a film.
Other purposes of this invention are to provide the growth equipment and the method with the above-mentioned feature that carried out reversible maintenance engagement of the extended assembly to the blood vessel wall of a site of puncture, and the tension giving means which frees the hand of an operator since growth equipment is held after growth equipment is arranged correctly in a site of puncture was established.
other purposes of this invention are to provide the growth equipment and the method with the above-mentioned feature that the tension giving means which carries out reversible maintenance engagement of the extended assembly to the blood vessel wall of a site of puncture was established by applying the tension of about 1 law which moves in a fixed range.
Other purposes and features of this invention will become clear from explanation of the following described in relation to an accompanying drawing about how to use the device and this device by a desirable embodiment of this invention.
Fig. 1 is a side view which fractured the part which shows the place which has the closing appliance for performing endermic access and the blockade to the site of puncture of a human body which introduced this invention and was provided with the closing means in a non-arrangement position, i.e., a retreated location.
Fig. 2 is a sectional view which meets two to 2 line of Fig. 1.
Fig. 3 is a perspective view which looked at the distal end of the device shown in Fig. 1 which has a closing means in an arrangement position, i.e., an expansion position, from the side.
Fig. 4 is a sectional view which meets four to 4 line of Fig. 3.
It is a sectional view showing the place in which the seal was formed to the site of puncture.

the -- the [A / 5 / figure -] --D [5] figures are Drawings in which how to use the device of this invention for blockading a blood vessel access part, i.e., a site of puncture, is shown.
Fig. 6 is a fragmentary perspective view showing another closing assembly of the closing appliance shown in Fig. 1.
Fig. 7 is a side view which fractured a part of other embodiments of the closing appliance which introduced this invention.
Fig. 8 is a sectional view which meets eight to 8 line of Fig. 7.
Fig. 9 is a sectional view which meets nine to 9 line of Fig. 8.
Fig. 10 is a sectional side elevation of the distal end of the device of Fig. 8.
The place which has a closing assembly in an arrangement position, i.e., an extended position, is shown.

Fig. 11 is a perspective view which fractured a part of other embodiments of the closing appliance which introduced this invention.
Fig. 12 is a sectional view which meets 12 to 12 line of Fig. 11.
Fig. 13 is a sectional side elevation which fractured a part of distal end of the closing appliance of Fig. 11.
The place which has a breech operating mechanism in an arrangement position is shown.

Fig. 14 is a sectional view which meets 14 to 14 line of Fig. 13.
the --A [15] figure is a side view which fractured a part of proximal edge of other embodiments of the closing appliance which introduced this invention.
the --B [15] figure -- the -- it is the side view which fractured a part of distal end of the embodiment shown inA [15] figure.
Fig. 16 is a sectional side elevation which fractured a part of distal end of the closing appliance of Fig. 15.
The place which has a closing assembly in an arrangement position is shown.

Fig. 17 is a sectional view which meets 17 to 17 line of Fig. 16.
Fig. 18 is a side view which fractured a part of other embodiments of the closing appliance, i.e., an extended position, which introduced this invention.
Fig. 19 is a sectional side elevation which fractured a part of distal end of the closing appliance of Fig. 18.
The place which has an extended assembly, the free position, i.e., the extended position, which are not provided with cover membrane, is shown.

Fig. 20 is a top view of the tension giving device of this invention seen from 20 to 20 line direction of Fig. 23.
Fig. 21 is a sectional view which meets 21 to 21 line of Fig. 23.
Fig. 22 is a side view which fractured some tension giving devices of this invention in an open position.
Fig. 23 is a side view which fractured some tension giving devices of this invention in a closing center valve position.
Fig. 24 is a sectional view of the device of Fig. 18 provided with one embodiment of a biological sealant introduction means.
Fig. 25 is a side view which fractured a part of other embodiments of the growth equipment of this invention.
The biological sealant introduction means is shown.

Fig. 26 is a sectional view which meets 26 to 26 line of Fig. 25.
Fig. 27 is a perspective view of the device of Fig. 18 provided with other embodiments of a biological sealant introduction means.
Fig. 28 is a perspective view showing the 3rd elongated member that blockades the 2nd tubular pore of the biological sealant introduction means of Fig. 27.
Fig. 29 is a sectional view which meets 29 to 29 line of Fig. 27.
Fig. 30 is a perspective view showing other embodiments of the 3rd elongated tube-like member which is a part of biological sealant introduction means of Fig. 27.
Fig. 31 is a perspective view of the device of Fig. 18 provided with other embodiments of a biological sealant introduction means.
Fig. 32 is a sectional view which meets 32 to 32 line of Fig. 30.
Generally, the closing appliance of this invention is used for the site of puncture of a human body, and the endermic blockade of a living body pipeline. The human body has an outer layer of the skin, and an inner layer of the organization which surrounds the blood vessel in which the tubular pore was formed with the blood vessel wall. A site of puncture crosses these layers and, in the case of a blood vessel access puncture, a blood vessel wall is crossed. The closing appliance has the flexible elongated tube-like member which had a proximal edge, a distal end, and an outer diameter, and has been prolonged along the longitudinal direction axis. The flexible elongated tube-like member has the 1st tubular pore that penetrated the elongated tube-like member and has been prolonged from the proximal edge to the distal end. A closing assembly is supported by the distal end and has a wrap non-transmission film for at least a part of breech operating mechanism and this breech operating mechanism. The disposition means supported by the proximal edge of the flexible elongated tube-like member is operated by people's hand. The

disposition means is connected with the closing assembly to which it is made to move to the arrangement position for forming the seal which blockades a site of puncture, the non-arrangement position, i.e., the contraction position, for extending through a flexible elongated tube-like member, and having a bushing pull wire, and introducing a closing assembly through a site of puncture.

In more detail, as shown in Fig. 1 - Fig. 4, the closing appliance 21 of this invention for performing the endermic blockade of a site of puncture and a living body pipeline consists of the flexible elongated tube-like member 22 formed with suitable plastic material, such as polyethylene, polyurethane, or polyimide. The flexible elongated tube-like member 22 has a longitudinal direction axis, and the proximal edge 23 and the distal end 24. The main 1st tubular pore 26 of the circular section is formed in the flexible elongated tube-like member 22, and this 1st tubular pore 26 is arranged in the center from the proximal edge 23 to the distal end 24. As shown in Fig. 2, it is provided in the flexible elongated tube-like member 22 again, the addition tubular pore 27, i.e., 2nd tubular pore, with a falcate section, and this 2nd tubular pore 27 is prolonged from the proximal edge 23 to the distal end 24, and the opening is carried out through the external port 28 by the distal end 24. Since the tubular pore 27 by the side of distance is blockaded from the port 28, in the tubular pore 27, the plug 29 which consists of a suitable material like a plastic is arranged.

The flexible elongated tube-like member 22 has a diameter of the range of one to 9 French who has suitable size, for example, is equivalent to the outer diameter of the range of about 0.3-3.0 mm. It has a suitable length of about 15-30 cm, for example, and the external port 28 adjoins the closing assembly 32, and the flexible elongated tube-like member 22 is arranged from 1-10 mm in the distance of about several centimeters from this closing assembly 32 to the juxtaposition side. Preferably, the 1st tubular pore 26 has an inside diameter of 0.020-0.030 inch, and, on the other hand, as for the 2nd tubular pore 27, in a falcate case, has 0.015-0.080 inch of long axis dimensions of about 0.015-0.080 inch.

The closing means which makes the gestalt of the closing assembly 32 is connected namely, fixed to the disposition means 33, i.e., a disposition mechanism, so that it may be supported by the distal end 24 of the flexible elongated tube-like member 22 and can move from contraction and a retreated location, i.e., a non-arrangement position, to an extended position, i.e., an arrangement position. The closing assembly 32 has the wrap non-transmission film 36 for the breech operating mechanism 34 and this breech operating mechanism 34. As shown in Fig. 3 and Fig. 4, the breech operating mechanism 34 is making complicated geometry like a coiled form in the free state. Although the coil 34 thin-long-changes, without carrying out permanent deformation, it is formed by the free state, i.e., a non restrained condition, by that most being almost even, i.e., a suitable material which returns to disk-like shape (the coil is annealed by this shape). There is the superelasticity element or shape memory element formed with the nickel/titanium alloy called Nitinol as one material considered to be suitable for such a use especially. The coil 34 has two or more almost circular turns 37, and the 1st end 38 and the 2nd end 39 which were fixed to the disposition mechanism 33 in the below-mentioned mode. The turn 37 of the coil 34 is arranged in the almost vertical single flat surface to the longitudinal direction axis of the flexible elongated tube-like member 22.

The coil 34 has the diameter chosen so that a site of puncture might be overlapped and a site of puncture might be blockaded like the after-mentioned. Generally, a suitable diameter of about about 5 mm is used preferably 3-7 mm. In the state of un-arranging, the restrained coil 34 has a suitable diameter of the range of 0.1-3 mm. 0.002-0.004 inch (0.05-0.1 mm) of coils 34 can be preferably formed with a wire with a diameter of about 0.003 inch (0.076 mm). Or the coil 34 can also be formed by the ribbon with a thickness of about 0.001-0.002 inch (0.025-0.05 mm), and a width of about 0.003-0.005 inch (0.076-0.13 mm) which has a rectangular cross section mostly.

The disposition means 33, i.e., a disposition mechanism, has the bushing pull wire 41 which has been arranged in the 1st tubular pore 26, i.e., a supervisor hole, was prolonged through this tubular pore 26, and was provided with the proximal edge 42 and the distal end 43. The bushing pull wire 41 is formed with a suitable material like stainless steel, and has a suitable diameter of about 0.005-0.032 inch.

A means to fix the both ends 38 and 39 of the coil 34 to the distal end 43 of the bushing pull wire 41 is formed, and this means consists of a solder which forms a joint, i.e., a bond joint. As shown in Fig. 1, the proximal edge 42 of the bushing pull wire 41 is projected from the proximal edge 23 of the flexible elongated tube-like member 22, and is connected with the handle assembly 44 like the after-mentioned.
The handle assembly 44 is formed with a suitable material like a plastic, and is attached to the proximal edge 23 of the flexible elongated tube-like member 22. A means to have size suitable for holding the handle 44 by people's hand, and to operate the bushing pull wire 41 is formed, and this means has the button 47 which can be operated by the digiti manus holding the handle 44. The button 47 is attached to the lobe 48 slidably attached in the longitudinal direction slot 49 of the handle 44, And the coil 34 is [that it should arrange from the contraction thin long position restrained in the retreated location 22, i.e., a flexible elongated tube-like member, to the extended position of the exterior of the tubular member 22] movable between the 1st position and the 2nd position. The proximal edge 42 of the bushing pull wire 41 is being fixed to the lobe 48 by suitable methods, such as a wire clamp or adhesives (not shown). The opening of the slot 49 is carried out to the notches 51 and 52 of the transverse direction established in the main part.
Like the after-mentioned, in the 1st position or the 2nd position, these notches 51 and 52 accept the lobe 48, and hold the bushing pull wire 41 to a desired position.

The closing means 32 has again the non-[flexible] transmission film 36 supported and fixed to the distal end 24 of the flexible elongated tube-like member 22. This film 36 has dramatically high flexibility, therefore within the limits of 0.0005-0.010 inch (0.0127-0.076 mm) has 0.001 inch (0.025 mm) of wall thickness preferably. The non-transmission film 36 can be formed with suitable arbitrary non-[flexible] transmission materials, such as an elastomeric material and a non-elastomeric material. For example, it is thought that latex or silicone is suitable. The film 36 should not penetrate blood and other fluids substantially. As for the film 36, it is preferred to form as tubular SOx with the long and slender almost cylindrical shape which has the other end surrounded by the opening 56 formed of the one end 54 and the rim 57 which were closed. This rim 57 is fixed to a hoop direction by a suitable method like adhesives (not shown) by the inside of the distal end 24 which is the 1st tubular pore 26, i.e., a supervisor hole, preferably. However, if it is a request, the rim 57 is also fixable to the outside surface of the tip part 31 of the distal end 24 of the flexible elongated tube-like member 22. The non-transmission film 36 is folded up along the bend line 58 in an inner direction in the supervisor hole 26 that it is arranged inside the distal end 24 of the flexible elongated tube-like member 22, and the breech operating mechanism 34 should be accommodated, the position, i.e., the non-arrangement position, which were restrained, and were retreated and contracted as shown in Fig. 1, at the time of manufacture of the device 21. The non-transmission film 36 has the flexibility moved to the method of outside by operation of the bushing pull wire 41 again to the SOx-like dashed line position 61 shown in Fig. 1.
The non-transmission film 36 can be made into the even shape of the shape of a disk as shown in Fig. 1 in the dashed line position 62. This operates the disposition mechanism 33, moves the bushing pull wire 41 to the distance side, presses the breech operating mechanism 34 to the distance side, takes it out out of the tubular pore 26, and is attained by making it move to the dashed line position 61. As soon as the breech operating mechanism 34 passes the supervisor hole 26, the breech operating mechanism 34 is extended to the memorized shape. If this extension is made, the film 36 which has covered the coil 34 will be moved to the disk-like round shape 62 from the SOx-like shape 61. Thereby, the film 36 is arranged at the both sides of the breech operating mechanism 34, and is located in a vertical parallel flat surface to the longitudinal direction axis of the flexible elongated tube-like member 22, and it blockades a site of puncture endermically so that it may mention later. The arranged breech operating mechanism 34 has sufficient rigidity which forms the holding frame of the film 36.
The closing appliance 21 has again the biological sealant introduction means 81 supported by the handle 44 and the flexible elongated tube-like member 22 for introducing biological sealant into

the site of puncture by the side of the juxtaposition of the closing assembly 32, after the closing assembly 32 is positioned. As biological sealant, there are suitable kinds, such as the two-ingredient fibrin glue, thrombin, fibrin, collagen thrombin, collagen, Avitene (trademark), Gelfo-am (trademark), cellulose, gelatin and these mixtures, or slurry. It should also care about that this device is used and other biological sealant or pharmacology agents (pharmacological agents) can be introduced into a site of puncture.
The biological sealant introduction means 81 can consist of fitting of a suitable kind like the Y adapter 82. The 1st and 2nd arms 83 and 84 are formed in the Y adapter 82, and the 1st and 2nd injectors 86 and 87 that accommodate two separate ingredients of the fibrin glue used as biological sealant are attached to these arms 83 and 84 removable. The fitting 82 is connected with the flexible pipe-like member 91, and the seal of this tubular member 91 is carried out into the handle 44.
The tubular pore (not shown) of the arms 83 and 84 and the tubular pore 92 open for free passage are formed in the tubular member 91. The distal end of the channel 92 in the tubular member 91 is adjusted with the 2nd tubular pore 27 of the flexible elongated tube-like member 22, and is opened for free passage. Thereby, if the injectors 86 and 87 are operated, biological sealant will be mixed, and it will pass along the channel 92, and will come out from the external port 28 of the 2nd tubular pore 27.
the [next,] -- the [A / 5 / figure -] -- with reference toD [5] figure, operation of the device 21 in the case of carrying out the method of this invention to blood vessel access and a blockade of the blood vessel access part of a human body and other sites of puncture and directions for use are explained. Here, it is assumed that the endermic femoral artery catheterization is carried out. If sterilization preparation is made, the thin wall hollow needle attached to the injector (not shown) will be endermically inserted through the wall 103 which forms the skin 101, the subcutaneous tissue 102 under this, and the lumen 104 of the blood vessel 107 like a femoral artery, and will form the site of puncture 106. Arterial access is checked by suction of arterial blood. Next, a needle lets a flexible wire (not shown) pass and it is led to the artery 107. Next, a needle is removed and only a wire is left behind to the prescribed position in the site of puncture 106. It lets the vasodilatation machine (not shown) provided with the short idiomatic upper position (over-lying) sheath 111 pass on a wire, it is led in the lumen 104 through the site of puncture 106, and a wire and a dilator are removed after that. the sheath 111 -- the -- as shown inA [5] figure, from a patient's outside of the body, it passes along the skin 101 and the subcutaneous tissue 102, and also is led in the lumen 104 through the wall 103. For example, since an operation is performed on a request like the angioplasty which introduces anticoagulant like heparin, it can let the various diagnoses with three to 24 French's diameter, a treating catheter, and other same medical devices pass in the sheath 111. At the time of ** of such arbitrary operations, such an instrument leaves only the sheath 111 and is removed.
Here, the situation of desiring a seal of the site of puncture 106 is assumed. The closing appliance 21 of this invention provided with the closing assembly 32 in a retreated location as shown in Fig. 1 is inserted in the sheath 111, and a standard sterilization preventative action is maintained simultaneously with this. The sheath 111 lets the distal end 24 of the flexible elongated tube-like member 22 pass, and it is drawn in the lumen 104. thereby -- the flexible elongated tube-like member 22 -- the -- as shown inA [5] figure, only a short distance from the distal end of the sheath 111 to several inches projects. Next, the sheath 111 is slowly pulled out to the juxtaposition side gradually, maintaining the device 21 to a state of rest as much as possible. the -- although it will be understood fromB [5] figure, the flexible elongated tube-like member 22 has the length which can remove the sheath 111 from the site of puncture 106, holding the distal end 24 in the lumen 104 without removing the handle 44. the sheath 111 -- the -- if it is pulled out as shown inB [5] figure, the closing assembly 32 can be arranged by operation of the disposition mechanism 33. As an option, only a slightly large distance introduces the distal end 24 of the flexible elongated tube-like member 22 in the lumen 104, and the sheath 111 is maintained to a prescribed position, and the device 21 is arranged, next the sheath 111 and the device 21 are pulled out slowly. After this has positioned the arranged device 21 suitably in the lumen 104, the sheath 111 is removable from the lumen 104.

before disposition of the closing assembly 32 -- the finger button 47 -- the -- it is in the position by the side of a juxtaposition most -- the lobe 48 -- the -- as shown inA [5] figure, it is ****(ing) in the notch 51. Here, the case where this wants to move the closing assembly 32 from the contraction position, i.e., the retreated location, which are arranged in the 1st supervisor hole 26 is assumed. The button 47 is drawn in from the notch 51, sliding advance is carried out in accordance with the slot 49 and the distal end 43 of the bushing pull wire 41 is extruded to the distance side to move the closing assembly 32 to an extended position, i.e., an open position. The breech operating mechanism 34 made from Nitinol carries out of the 1st tubular pore 26, i.e., a supervisor hole, by this the non-transmission film 36 moved forward and folded up at the distance side, and it is made the SOx-like shape where the non-transmission film 36 is shown in Fig. 1 in the position 61. The bushing pull wire 41 is further moved to a longitudinal direction by the continuation advancing movement of the finger button 47. Thereby, a breech operating mechanism is further moved to the distance side until the breech operating mechanism 34 passes through the 1st tubular pore 26. Thereby, the breech operating mechanism 34 can be extended freely, the superelasticity shape, i.e., the shape memory shape, of a coil which support the non-[flexible] transmission film 36, and as shown in Fig. 1 and Fig. 4, it can be made into the disk-like shape where it is expressed by the position 62. Next, a finger knob is positioned so that the lobe 48 may **** in the notch 52.

If the breech operating mechanism 34 is arranged thoroughly, the flexible elongated tube-like member 22 will be gradually retreated using the handle 44, and close engagement of the even proximal side surface of the flexible member 36 and the inner surface of the wall 103 which forms the lumen 104 by which the closing assembly 32 is arranged will be carried out.

This forms a fluid sealing seal between the walls 103 which adjoin the closing assembly 32 and the site of puncture 106 directly, and, for this reason, exact and effective deposition of biological sealant is enabled in the site of puncture 106 like the after-mentioned. When such a fluid sealing seal plans leakage control of the blood passing through the site of puncture 106 in relation to this invention again, it is required. Blood is kept from barring a blockade and carrying out a seal for the site of puncture 106 safely and eternally, and this prevents sealant from depositing in a blood vessel suddenly.

Formation of the good seal between the closing assembly 32 and the wall 103 of the blood vessel 107 is checked by some methods. For example, that arterial blood does not exist in the site of puncture 106 functions that it should be checked that the good seal has been formed. If blood is attracted from the 2nd tubular pore 27 as blood does not return to the 2nd tubular pore 27, it can also be pointed out that the device 21 can be arranged correctly. Or X-ray fluorography can be used for the check of the position of the closing assembly 32. Since the closing assembly 32 has radiopacity, this is possible. A radiopacity color can also be used although it checks whether the seal of the site of puncture 106 has been carried out effectively. Into the subcutaneous tissue 102 which adjoins the site of puncture 106, a small amount of radiopacity colors can also be poured in. When existence of intravascular ****** is proved by X-ray fluorography, this shows that arrangement of the closing assembly 32 is insufficient. When there is a certain disclosure, make a finger engage with the button 47 and it retracts from the notch 52, Move only a slight distance to the juxtaposition side, next make it move to the distance side, the mechanical assembly 32 is made to re-arrange, and the handle 44 is held after that, and the flexible elongated tube-like member 22 is pulled to the juxtaposition side, and reestablishment of the seal with the wall 103 contiguous to the site of puncture 106 is carried out.

introducing the biological sealant used in the site of puncture 106, as soon as a good seal is formed with a described method between the walls 103 contiguous to the closing assembly 32 and the site of puncture 106 -- the, as shown inC [5] figure, The sealant 116 of the blood vessel 107 which continues and exists in the whole site of puncture 106 from the outside to the outside surface of the skin 101 immediately can be formed. However, it should care about that it is not necessary to introduce a lot of [like it comes out of the skin] sealant. If biological sealant assumes that it is the fibrin glue supplied in two ports of the injectors 86 and 87, The doctor who uses the closing appliance 21 while holding the handle 44 in one hand operates the injectors 86 and 87 using the hand of another side, and introduces the ingredient of biological sealant in the Y

adapter 82. It is mutually mixed within the Y adapter 82, and both ingredients are introduced through the tubular member 91, and pass along the exit port 28 contiguous to the closing assembly 32 after that. If suitable arbitrary devices like pin vice are applied to the flexible elongated tube-like member 22 which adjoins the skin 101 directly in addition to holding the handle 44 that engagement to the closing assembly 32 and the blood vessel wall 103 should be maintained, engagement is maintained and the doctor can get a free hand. the fibrin glue carrying out the seal of the innermost panniculus of the site of puncture 106, next passing along the subcutaneous tissue 102 like the after-mentioned -- up to the skin 101 -- the -- the back filling of the site of puncture 106 can be carried out, and it can be carried out so that the distal end 24 of the flexible elongated tube-like member 22 may be surrounded, as shown inC [5] figure. If necessary, completion of this ****** is observable by the fibrin glue which comes out from the site of puncture 106. As soon as ****** is completed, a doctor stops moving the injectors 86 and 87 more, and hold the handle 44, hold the closing assembly 32 to a prescribed position, and the fibrin glue can form adherence coagulation in the site of puncture 106, but. It enables it to harden in the site of puncture 106 over time not to form the coagulation which makes it impossible to become hard too much and to pull out the closing appliance 21 easily. Generally, this time is a range for 30 seconds - 15 minutes, and is for about 1 to 2 minutes preferably. Said biological sealant is pasted up only on the collagen content organization which prevents this sealant from pasting the flexible elongated tube-like member 22. If a doctor judges that the fibrin glue changed into the request state, it is made to move so that a finger may be made to engage with the button 47 supported by the handle 44 and it may come out of the slot 52, and next it will be made to retreat to the juxtaposition side within the slot 49, and the bushing pull wire 41 will be moved to the juxtaposition side. By this, the breech operating mechanism 34 is Masanao-ized gradually, it goes into the inside of the tubular pore 26 mostly, the flexible film 36 is folded up, and it comes to occupy SOx-like shape mostly. In this way, the button 47 can pull out gently from the seal 116 in which the closing appliance 21 was formed in the site of puncture 106 when it was most moved to the position by the side of a juxtaposition and was put in in the notch 51. The hole (not shown) left behind in the sealant 116 after the cash drawer of the film 36 supported by the flexible elongated tube-like member 22 and this is closed of itself with the character of the fibrin glue or other sealant gel enough. Then, the site of puncture 106 is observed that it should be checked whether bleeding has arisen from here. biological sealant forms the biological seal which remained and was excellent in the site of puncture -- for example, about one to two weeks -- it will be comparatively absorbed by the body for a short time.

As mentioned above, it will be understood that the method of using the closing appliance which makes it possible to close promptly and efficiently a site of puncture required to carry out the medical operation of a request like an angioplasty, for example, and this closing appliance was provided. While performing treatment which prevents formation of a clot, the seal which was excellent even when introducing the anticoagulant into a patient's blood is formed. Thus, if the fibrin glue is applied, the good coagulation which makes danger of re-bleeding there be nothing and carries out the seal of the site of puncture can be formed.

It can continue being flowed through blood between this treatment that carries out the blockade of a site of puncture, without being substantially barred through the lumen 104 of a blood vessel. this -- hindrance -- there is nothing -- things -- a closing appliance -- 21 -- a distal end -- size -- it is small -- things -- and -- this -- a device -- 21 -- a distal end -- 24 -- supporting -- having had -- closing -- an assembly -- 32 -- size -- it is small -- things -- it is -- a sake -- possible -- becoming . When the closing assembly 32 is arranged as mentioned above, the closing assembly 32 has a comparatively small diameter compared with the size of the lumen into which this is introduced. Since the closing assembly 32 has even shape, when engaging with the inner surface of the wall 103, the closing assembly 32 serves as an inner surface of the wall 103 substantially in the same field. Even when the closing assembly 32 is removed, the closing assembly 32 can occupy very small space, and can pull it out easily.

Other embodiments of the closing assembly are shown in Fig. 6. This embodiment is used instead of the closing assembly 32 of the distal end 24 of the flexible elongated tube-like member 22

supported by the handle 44. The closing assembly 131 consists of the breech operating mechanism 132 covered with the non-[flexible] transmission film 133 like a graphic display. Although the breech operating mechanism 132 can be formed with the same superelasticity shape or shape memory material as the breech operating mechanism 34, another complicated shape like the shape of a flower as shown, for example in Fig. 6 instead of coiled shape as shown in Fig. 1, Fig. 3, and Fig. 4 is used. In this way, the breech operating mechanism 132 can be formed with one ribbon made from Nitinol or a wire provided with the ends 137 and 138 fixed to the distal end 43 of the bushing pull wire 41 by the same method as the above-mentioned. The wire ribbon 136 is annealed so that it may have superelasticity shape or shape memory shape with the flower-like shape where the loop 141 of plurality (the thing of a graphic display is three) is formed in the wire ribbon 136. The loop 141 makes the ellipse form of the same size mostly, and has the curvature shape heel 142. The loop 141 is in a single flat surface, and it has a longitudinal direction axis of the loop which separated about 120-degree regular intervals mutually. If it is a request, the addition loop which continued for 360 degrees and separated regular intervals can be established. Since the loop 141 is in agreement with the shape of the petal of a flower, the shape shown in Fig. 6 can be explained as flower structure, and the loop 141 is in a common flat surface almost vertical to the longitudinal direction axis of the flexible elongated tube-like member 22.

The film 133 which forms some closing assemblies 131 can be formed with the same material as the film 36, and is fixed in the same mode as the tubular member 22. For this reason, when the breech operating mechanism 132 is in the retreated location in the tubular pore 26, the folded part of the same mode as the film 36 can be provided. The breech operating mechanism 132 is Masanao-ized in the same mode, and is moved to the same retreated location as the breech operating mechanism 34. The closing assembly 131 is also arranged in the same mode. When arranged, the closing assembly 131 makes a non-transmission film almost even shape. this shape was determined by the curve heel 142 of the loop 141 -- substantial -- circular -- **** from the circle between the heels of the contiguity loop 141 -- it is changing slightly. In this way, a good seal with the wall 103 of the blood vessel 107 is formed like the closing assembly 32. In this way, an operation and use of Fig. 6 of a closing assembly are almost the same as the thing explaining use of the closing assembly 32, and have the almost same supplementary strong point. It should care about that a non-transmission film is suitably arranged by composition of other breech operating mechanisms, and a seal can be formed, without deviating from the range of this invention. The size and shape of a closing assembly can be chosen so that it may be suitable for the site of puncture which should be blockaded. In this way, flower structure shown in Fig. 6 can be made into the coil structure and the same size which are shown in Fig. 1, Fig. 3, and Fig. 4, or can be made greatly and small according to a request. Shape is also changeable into a substantial triangle or square from a round shape by changing the number of petals, i.e., a loop.

Other embodiments of the closing appliance which introduced this invention are shown in Fig. 7 - Fig. 10.The closing appliance 151 is shown here. This closing appliance 151 resembles very well the closing appliance shown in Fig. 1, and the main differences are in the form of the closing assembly used for the distal end 24 of the flexible elongated tube-like member 22. In this way, all the parts of the closing appliance 151 are using the same reference number as the closing appliance 21 shown in Fig. 1 for the distal end 24 by which the closing assembly 156 is supported. The closing assembly 156 has the breech operating mechanism 157 covered with the non-[flexible] transmission film 158. The breech operating mechanism 157 has, at least three struts, i.e., the arm, which separated the interval from two or more rod-like elements 161 to the hoop direction, and these arms have the proximal edge 162 embedded in the distal end 24 of the flexible elongated tube-like member 22. this extrudes the plastic which forms a tubular member on the proximal edge 162 -- or it is attained by providing the boa adjusted to the axial direction in the distal end 24, and fixing the proximal edge 162 in a boa by a suitable means like adhesives. The exposed portion of the rod-like element 161 shown in Fig. 7 was formed with stainless steel or a suitable material like Nitinol, and inclined in the method of the inside of a distance side direction, and has given the shape of truncated cone shape. It is joined namely, fixed to one by suitable methods, such as welding or low attachment, and the distal end 163 of the rod-like

element 161 forms the almost hemispherical tip part 166. These tip parts 166 are being fixed also to the distal end 43 of the bushing pull wire 41, the rod-like element 161 -- weakening -- the field, i.e., a notch, or the memorized bending point 171 is established, and these notches form the hinge point 171 in the equidistant position mostly from the proximal edge 162 and the distal end 163. The length of the exposed portion of the rod-like element 161 is chosen so that it may be in agreement with the diameter as which the breech operating mechanism 157 was chosen.
It has SOx-like shape with the closed end part 176 by which the wrap film 158 is arranged on the hemispherical tip part 166 in the breech operating mechanism 157, and the open end part formed of the circular rim 177 joined by the outside surface of the distal end 24 of the flexible elongated tube-like member 22 with adhesives (not shown).
Operation of the closing appliance 151 and directions for use are explained briefly [below]. Levy (imposition) of the button 47 to the notches 51 and 52 is reversed. That is, a button is positioned not in the notch 51 but in the notch 52, when the closing assembly 156 is in the non-arrangement position, i.e., the non-expanded state, which are shown in Fig. 7. The closing appliance 151 is introduced in the sheath 111 by the non-expanded state which was mentioned above about the device 21 and which is a mode and is shown in Fig. 7. After the closing assembly 156 is introduced in the lumen 104 of the blood vessel 107, the closing assembly 156, The button 47 is moved to the juxtaposition side, tensile force is applied to the hemispherical tip part 166, extrusion power is applied to the rod-like element 161, and this bends a rod-like element to the method of outside, and it bends around the hinge point 171, namely, folds up, and a rod-like element is made to support by the film 158 simultaneously. When continuous movement of the button 47 is carried out to the juxtaposition side until the button 47 reaches the slot 51, the rod-like element 161, It is made to extend from a longitudinal direction axis radially almost right-angled to the longitudinal direction axis of the flexible elongated tube-like member 22, as these portions 161a are carried on the portion 161b and it is shown in Fig. 10. In a rod-like element, the wrap film 158 becomes the almost circular disk-like shape which lies in a single flat surface similarly, and is contacted by the inner surface of the wall 103 of the blood vessel 107 in the mode also with the same film 158 of this disk-like shape as the closing assembly 32 contacted the wall as mentioned above. Then, the above-mentioned treatment is used for enabling introduction of biological sealant that a seal should be formed in the site of puncture 106. If this procedure is completed, the breech operating mechanism 157, Until it becomes, the shape, i.e., the almost cylindrical shape by which disposition release was carried out, where it does not extend of the longitudinal direction axis of the flexible elongated tube-like member 22, and the origin of it to adjust, as the closing assembly 156 is shown in Fig. 7, By moving the knob 47 to the juxtaposition side and moving the hemispherical tip part 166 which supports the film 158 to the distance side by the bushing pull wire 41, The breech operating mechanism 157 is moved to a non-expanded state, disposition release is carried out, the closing appliance 151 is removed after that, and the blockade of a request of the site of puncture 106 can be formed. By changing the number of rod-like elements, the shape of a closing assembly can be changed similarly and can arrange this closing assembly at an even triangle, a square, or an ellipse form. This closing assembly 156 is a point which can be formed again without using a hyperelastic material or a shape memory material, and differs in the closing assembly 32 and the closing assembly 131.
Other embodiments of the closing appliance which introduces this invention are shown in Fig. 11, Fig. 12, and Fig. 13.
This embodiment resembles very well the closing appliance shown in Fig. 7 except for the point that the closing assembly supported by the distal end 24 of the flexible elongated tube-like member 22 is structure which is different in the closing assembly 156.
The closing assemblies 196 differ in the closing assembly 156 in that the distal end 24 of the flexible elongated tube-like member 22 is supporting the addition segment 192 which consists of flexible elongated tube-like material.
The addition segment 192 forms a part of breech operating mechanism 197 which was joined or annealed by the tip part 31 of the distal end 24 of the flexible elongated tube-like member 22, and was covered with the unpenetrated flexible film 198.

The addition segment 192 has, the supervisor hole, i.e., 1st tubular pore, with a circular section, and comprises a segment of the flexible elongated tube-like member extruded by structure without an addition tubular pore. It is blockaded by the addition segment 192 joined or annealed, and any plugs of the 2nd tubular pore 27 of this device 191 are unnecessary. In order to form the breech operating mechanism 197, to the addition segment 192 of the flexible elongated tube-like member 22. As shown in two or more arc segments, for example, Fig. 11, and Fig. 12, in order to form the four segments 24a, 24b, 24c, and 24d, the slit 201 of the suitable number prolonged in the longitudinal direction which separated the interval is formed in the hoop direction. Like the after-mentioned, since the segments 24a, 24b, and 24c are formed with the flexible material, it can turn at them to the method of outside. The closing assembly 196 has the rod-like element 161 and two or more same rod-like elements 202 again, and is formed with suitable materials, such as stainless steel or Nitinol. since [however,] the arc segments 24a, 24b, 24c, and 24d are used -- the rod-like element 202 -- about 1/2 of the length of the rod-like element 161 -- with -- it is good. 0.002 inch of rod-like elements 202 as well as the rod-like element 161 can be preferably made into a suitable diameter of 0.002-0.003 inch, for example. The proximal edge 203 and the distal end 204 are formed in the rod-like element 202. A proximal edge is a suitable method and is embedded in the arc segments 24a, 24b, and 24c and 24d. For example, the boa which accepts the end 203 which extrudes the plastic which forms a segment on the end 203, or is fixed by suitable means, such as adhesives (not shown), can also be provided in a segment. The rod-like element 202 is prolonged in the distance side and the inner direction that a truncated cone should be formed, and these distal ends 204 are linked by the almost hemispherical tip part 206 formed from the low attachment part or weld zone joined also to the distal end 43 of the bushing pull wire 41 as shown in Fig. 11. the notch for forming the hinge point 208 in the rod-like element 202, and weakening -- the field or the memorized knee point is established. As for these hinge points 208, it is preferred to approach the arc segments 24a, 24b, 24c, and 24d so that the hinge point 208 may approach the joined part between the end 203, and the adjacent segments 24a and 24b and 24cN24d. The length of each arc segments 24a, 24b, 24c, and 24d and each rod-like element 202 is almost equal, and in agreement with the desired size of the breech operating mechanism 197.

The film 198 covers the breech operating mechanism 197, and has the same cubic shape as the shape (conformation) of the film 158. the closed end 211 which appears in the film 198 on the hemispherical tip part 206, and the open end part surrounded by the rim -- it is provided. An open end part is pasted up on the additional portions 192 of the flexible elongated tube-like member of the slit 201 which forms the segments 24a, 24b, 24c, and 24d immediately annealed by the tip part 31 of the distal end 24 of the flexible elongated tube-like member 22 by the juxtaposition side, And it is fixed here by a suitable means like adhesives (not shown).

Operation of the closing appliance 191 and directions for use as shown in Fig. 11 and Fig. 12 resemble very well the operation and directions for use explaining the embodiment of the closing appliance 151 shown in Fig. 7. The button 47 is arranged in the notch 52 and the closing appliance as shown in Fig. 11 has the closing assembly 196 in a non-arrangement position, i.e., a non-expanded state. About the seal of the site of puncture after the distal end 24 of the breech operating mechanism 197 has been arranged in the blood vessel by the side of the distance of the site of puncture 106 in more detail than the device 191, the closing assembly 196, Move the button 47 to the juxtaposition side and tensile force is applied to the bushing pull wire 41, Compressive force is applied to the rod-like element 202 like a strut, and this rod-like element 202 and the arc segments 24a, 24b, 24c, and 24d are bent to the method of outside by the sharp elbow of this segment produced immediately at the hinge point 208 by the side of distance. As the rod-like element 202 appears upwards substantially and it was shown in Fig. 13 and Fig. 14, the knee to the method of this outside The segment 24a, Are continued until it forms the even disk-like shape which becomes almost parallel to 24b, 24c, and 24d, and is mostly in agreement with the disk-like shape of the above-mentioned closing appliance, and by this, The arc segments 24a, 24b, 24c, and 24d are bent to the longitudinal direction axis of the flexible elongated tube-like member 22 by the method of outside, and the rod-like strut element 202 is similarly bent to the hemispherical tip part 206 by the method of outside, with the non-[flexible]

transmission film 198 supported. although the shape shown in Fig. 14 is a square mostly, it will be understood easily that an addition arm with a membranous peripheral part being much more gently-sloping for establishing the addition segment of the distal end 24 and the addition rod-like element of the same number, and controlling movement of the film 198 to become circular can be provided according to a request. As it mentioned above about other embodiments, membranous shape can be made into an ellipse form, a triangle, or a square based on the number of elements.

If it is arranged as the closing assembly 196 shows in Fig. 13 and Fig. 14, the closing assembly 196 is the mode mentioned above about the front closing appliance, and is applicable to formation of a seal with the inner surface of the wall 103, and introduction of subsequent biological sealant. If this is attained, the closing assembly 196, Until the segments 24a, 24b, 24c, and 24d and the rod-like element 202 are moved, the original non-arrangement position, i.e., contraction position, which are shown in Fig. 11, and the button 47 enters in the notch 52, It can contract and disposition cancel by moving the button 47 from the notch 51, and pushing the button 47 at the distance side, pushing aside the hemispherical tip part 206 to the distance side, and bending the segments 24a, 24b, 24c, and 24d and the rod-like element 202 to an inner direction. Then, the closing appliance 191 can be retreated in the same mode as having mentioned above about the front embodiment.

Other embodiments of the closing appliance which introduces this invention are shown in Fig. 15 and Fig. 16. Although the closing appliance 221 shown here is the same as the closing appliance shown in Fig. 1, The main points of difference have the device 221 in using a disposition means to introduce the same element as the closing assembly of the distal end 24 of the flexible elongated tube-like member 22, and both of a device who showed in the device and Fig. 7 - Fig. 10 showing in Fig. 1. The closing assembly 222 has the wrap non-transmission film 224 for the breech operating mechanism 223 and this breech operating mechanism 223. Although the breech operating mechanism 223 can be formed with the same hyperelastic material or shape memory material as the breech operating mechanism 34, it can make shape shape other than the coiled form which consists of the rod-like element 226 or arm which separated the interval to at least three hoop directions provided with the proximal edge 227 and the distal end 228. About 180-degree folded part which can form each rod-like element 226 similarly with a Nitinol ribbon or a wire, and is located at the halfway point 229 between the proximal edge 227 and the distal end 228 is annealed. It is made for the element 226 to lap in the halfway point 229 in a free state by this mutually [the juxtaposition side half part 231 of the chip box knee and rod-like element 226, and the distance side half part 232] in a single flat surface. A means to fix the proximal edge 227 of each rod-like element 226 to the disposition mechanism 230 in the mode described below is formed. It is fixed to one by suitable methods, such as welding or low attachment, and the distal end 228 of the rod-like element 226 forms the almost hemispherical tip part 233. This tip part 233 is fixed also to the disposition mechanism 230 by the method of mentioning later. Like the closing appliance 151 shown in Fig. 7 - Fig. 10, the length and the number of the rod-like elements 226 are chosen so that it may be in agreement with the diameter and shape where the breech operating mechanism 223 was chosen.

The film 224 which forms some closing assemblies 222 is formed with the same material as the film 36, and is fixed to the tubular member 22 in the same mode. Thereby, a folded part is provided in the film 224, and the film 224 functions on it in the same mode as the film 36.

It consists of the bushing pull wire 234 formed with a suitable material like stainless steel, and this bushing pull wire 234 is slidably arranged in the 1st tubular pore 26, i.e., a supervisor hole, and the disposition mechanism 230 has the same proximal edge 236 and distal end 237 as the bushing pull wire 41. The main points of difference are provided during formation, the central tube hole 23, i.e., the boa, which have been prolonged from the proximal edge 236 to the distal end 237 in the bushing pull wire 234. The bushing pull wire 234 has a suitable outer diameter of about 0.020 inch (0.5 mm), and an inside diameter of about 0.010 inch (0.25 mm). A means to fix the proximal edge 227 of the rod-like element 226 to the distal end 237 of the bushing pull wire 234 in a hoop direction is formed. The proximal edge 227 where the element 226 was fixed extended for 360 degrees, and has separated regular intervals, the peak of each halfway point

229 is bent toward the method of outside, and the element 226 has the same weld zone or the joints 239 and 241 which carry out hard soldering injury formation. The proximal edge 236 of the bushing pull wire 234 came out from the proximal edge 23 of the flexible elongated tube-like member 22, and has extended, and is connected with the handle assembly 242 by the same method as the device 21. It has the 2nd small pull wire 243, and this pull wire is arranged in the central tube hole 238 of the large bushing pull wire 234, and the disposition mechanism 230 is attached slidably. The pull wire 243 has the proximal edge 244 and the distal end 246. The pull wire 243 is similarly formed with a suitable material like stainless steel, and has a suitable diameter of 0.005-0.030 inch. A means to fix the distal end 246 of the pull wire 243 to the semi-spherical tip part 233 is formed, and this means consists of a low attachment part or a weld zone. The proximal edge 244 of the pull wire 243 of the smaller one also came out from the proximal edge 23 of the flexible elongated tube-like member 22, and has extended, and it connects with the handle assembly 242.

This handle assembly 242 is added to supporting the means which causes longitudinal direction movement of the bushing pull wire 234 which was shown in Fig. 1 and explained above, The means which causes movement of the pull wire 243 which meets a longitudinal direction axis unrelated to movement of the bushing pull wire 234 as explains below is also supported. Although the handle assembly 242 is the same as the handle assembly 44, the main points of difference are also being able to perform access to the proximal edge 244 of the pull wire 243 with the smaller handle assembly 242. Although the fixing means of the bushing pull wire 234 to the lobe 247 and this lobe 247 of the handle assembly 242 is the same as the fixing means to the lobe 48, The tubular pore 248 is also formed in the lobe 247, and this tubular pore 248 is prolonged from the proximal edge 249 of the lobe 247 to the distal end 251, and it consistents with the central tube hole 238 of the proximal edge 236 of the bushing pull wire 234. The handle tubular pore 250 is prolonged in the juxtaposition side from the proximal edge of the handle slot 255, and is adjusted with the proximal edge 249 of the slot 255 and the tubular pore 248 of the lobe 247. The hole 252 is formed in the proximal edge of the handle 242 at the handle tubular pore 250. The proximal edge 244 of the pull wire 243 of the smaller one came out from the proximal edge 236 of the bushing pull wire 234, extended in the juxtaposition side, and passed along the tubular pore 248 and the handle tubular pore 250 of the lobe 247, and also came out of the handle assembly 242 through the hole 252, and has extended slidably in the juxtaposition side. It is provided in a means to fix the proximal edge 244 of the pull wire 243 to a specific position, for example that the pull wire 243 slides on the distance side, the clamp 253, i.e., the knob, to prevent and in which easy release is possible.

Operation of the closing appliance 221 and directions for use are explained briefly [below]. The actuated valve position of the button 254 for operation of the closing appliance 221 and use is the same as the actuated valve position of the button 47 of the closing appliance 21 shown in Fig. 1. The closing appliance 221 is the method mentioned above about the device 21, makes, the non-extending cylindrical shape, i.e., the shape where it does not arrange, which are shown in Fig. 15, and can introduce it in the sheath 111. Although disposition and the disposition release also of the closing assembly 222 can be carried out in a similar way, the main points of difference are in the addition stage which arranges the pull wire 243 by the below-mentioned method, and carries out disposition release. If the button 254 is similarly used for a start and maintenance of the closing assembly 222 of disposition by extruding the breech operating mechanism 223 from the distal end 24 of the flexible elongated tube-like member 22, the rod-like element 226 and the film 224 will become disk-like, i.e., even circle configuration, shape mostly. As for this shape, a part is determined by the number of the rod-like elements 226. In order to assume that it becomes almost even shape with the closing assembly 222, the small pull wire 243 is pulled to the juxtaposition side, and it fixes to a prescribed position using the clamp 253. On the other hand, the bushing pull wire 234 is held to a state of rest, and applies tensile force to the semi-spherical tip part 233, and applies extrusion power to the rod-like element 226, and folds up this rod-like element 226 further around these halfway points 229. Thereby, the juxtaposition side half part 231 of the element 226 and the distance side half part 232 lap mutually in an almost right-angled single flat surface to the longitudinal direction axis of the

flexible elongated tube-like member 22. Then, the seal of the site of puncture 106 is established using the above-mentioned procedure, and introduction of biological sealant is enabled. If this procedure is completed, by canceling the clamp 253, disposition release of the closing assembly 222 will be carried out, the small pull wire 243 can be extruded to the distance side by this, and as mentioned above about the closing appliance 21, a disposition release sequence will be completed in a similar manner.
It should care about that another change mode of a pull-wire assembly can be used. For example, so that the position of a pull wire may be fixed to the longitudinal direction axis of a flexible elongated tube-like member, A means to attach a pull wire in the tubular pore of a bushing pull wire is formed, and the same tensile force acts on a semi-spherical tip part simultaneously, and it is made for extrusion power to act on a rod-like element as mentioned above by independent longitudinal direction movement of a bushing pull wire.
They are other embodiments incorporating the closing assembly using the arc segment shown in Fig. 11, Fig. 12, and Fig. 13, and the same arc segment, without using a rod-like element, It is directly joined to the tip part of the distal end of a flexible elongated tube-like member by the distance side tip part of a bushing pull wire, and by the traction by the side of the juxtaposition of a bushing pull wire. The embodiment of composition of that the compressive force applied to an arc segment causes the knee to a way outside an arc segment, the bending point, i.e., the folded part, which are produced at the halfway point of a segment, can also be considered. It is the breech operating mechanism constituted from a hyperelastic material or a shape memory alloy by the addition closing assembly, The breech operating mechanism arranged by coming out of the distal end of a flexible pipe-like member, and extruding a breech operating mechanism to the distance side, next rotating the proximal edge of a bushing pull wire, and twisting a hyperelastic material or a shape memory alloy mechanism can be established. In various embodiments, a non-transmission film is also directly fixable to a breech operating mechanism instead of fixing to the distal end of a flexible elongated tube-like member. Or the film can constitute a part of breech operating mechanism so that only the juxtaposition side of the breech operating mechanism arranged, for example may be covered.
Other embodiments, the extensible device, i.e., the closing appliance, which introduce this invention, are shown in Fig. 18 and Fig. 19. the 1st elongated tube-like member 302 formed by plastic material with the suitable device 301 shown in these Drawings, and a desirable casting thermosetting material like polyimide — it has the flexible elongated tube-like member 302 preferably. The 1st flexibility elongated tube-like member 302 has the longitudinal direction axis which has the proximal edge 303 and the distal end 304, and was prolonged from the proximal edge 303 to the distal end 304. The 1st tubular pore 306 that has a circular section in the member 302 is formed.
This 1st tubular pore 306 is arranged in the center from the proximal edge 303 to the distal end 304 like a graphic display.
The outside surface of the polyimide member 302 and both sides of an inner surface can be coated with a lubricative material like Teflon (Teflon, trademark). Or since an inner surface and an outside surface with desired lubricity are formed, the thermosetting material can consist of polyimide Teflon or a polyimide nylon Teflon composite material. The 1st flexibility elongated tube-like member 302 has about 0.008-0.050 inch of outer diameters of about 0.018 inch preferably. The 1st flexibility elongated tube-like member 302 has a suitable length of about 10-150 cm, for example. The 1st tubular pore 302 of the 1st flexibility elongated tube-like member 302 has about 0.003-0.030 inch of inside diameters of 0.012 inch preferably.
The expansion means which makes the gestalt of the extended assembly 307 is supported by the distal end 304 of the 1st flexibility elongated tube-like member 302, and is movable between a contraction position and an extended position. The disposition mechanism 308 is supported by the proximal edge 303 of the 1st flexibility elongated tube-like member 302, and can be operated now from a contraction position by people's hand to an extended position, i.e., an arrangement position.
The assembly 307 has the wrap film 311 for the extension member 309 and this extension member 309. setting the extension member 309 to a free state, as shown in Fig. 19 —

complicated geometry -- the gestalt of the helical coil 312 is made preferably. material with the suitable helical coil 312 -- preferably, it is formed by Nitinol, and it returns to thin length-ization, i.e., the helical-coil shape currently annealed in the free state, i.e., a non restrained condition, in body temperature although restrained, without carrying out permanent deformation. The helical coil 312 has two or more almost circular turns which form the juxtaposition side turn 313, the middle turn 314, and the distance side turn 316 preferably. The juxtaposition side turn 313, the middle turn 314, and the distance side turn 316 are not mutually even. Each of the juxtaposition side turn 313 and the distance side turn 316 is almost parallel mutually, and is located in an almost vertical flat surface to the longitudinal direction axis of the 1st flexibility elongated tube-like member 302. The middle turn 314 is not even, since it has connected with the juxtaposition side turn 313 and the distance side turn 316, it is helical [-like], and for this reason, a non-restraining helical coil becomes congruence conical shape.
When a free state, i.e., a non restrained condition, has the middle turn 313, it has a suitable diameter within the limits of 2-10 mm, and a diameter of 4-6 mm is used preferably. the after-mentioned -- like -- under disposition -- the middle turn 313 -- the film 311 -- a part -- flattening -- and it is restrained, and becomes a diameter of the range of 1-10 mm (preferably 11 French), a site of puncture is overlapped, and the blockade is assisted. The juxtaposition side turn 313 and the distance side turn 316 are the same size mostly, and have a diameter of 2-3 mm preferably 1-5 mm. The non-restraining helical coil 312 has the distance of 5-8 mm preferably about 3-15 mm from the juxtaposition side turn 313 to the distance side turn 316. In the state of un-arranging, the helical coil 312 retreats to the 1st flexibility elongated tube-like member 302, And it has a contraction restricted diameter in which 0.002-0.010 inch is almost equal to the diameter of the Nitinol wire preferably used for the composition of the expansion mechanism 309 of the range of 0.005-0.006 inch. In the distance side tip part of the Nitinol wire which is in agreement with the free end of the distance side turn 316. A limb, for example, a small ball, or the flat tip part 310 is formed preferably, The film 311 is prevented from exploding with a wire during operation of a device, and friction of the tip part 310 to the wall of the tubular pore 306 of the 1st flexibility elongated tube-like member 302 (from this member 302, the expansion mechanism 309 carries out like the after-mentioned, and is extruded) is reduced. It can form by suitable methods, such as the ball 310, arc welding, low attachment, adhesion of a polymer on a wire, or folding of a wire top end part.
It has the bushing pull element 317, i.e., a member, and this bushing pull element 317 is formed with a suitable material like stainless steel, and the disposition means 308, i.e., a disposition mechanism, has 0.005-0.030 inch of suitable diameters of 0.010 inch preferably, for example. The extension member 309 and the bushing pull element 317 are combined with one using one method in the way it is constituted independently and some differ. Low being [it] joinable or attachment [both] one In order to give the optimal torque, the stainless steel wire 317 is ground and the tapered shape portion 317a is formed in the distal end 319. The tapered shape portion 317a is inserted into the end of the elongated member 320 which is made from a suitable material like stainless steel, and is often called a hypo tube, and is pasted up in an end using suitable adhesives like Loctite (trademark). The proximal edge 318 of the extension member 309 of a Nitinol wire is also inserted into the opposite side edge part of the hypo tube 320, and is joined. The hypo tube 320 of stainless steel shall be 4.5 cm preferably 2-15 cm. the hypo tube 320 -- 0.005-0.030 inch -- desirable -- the outer diameter of 0.010 inch -- and 0.003-0.010 inch can be preferably made into an inside diameter of 0.006 inch.
Or the bushing pull wire 317 and the expansion mechanism 309 can be formed with the single piece which consists of a Nitinol wire, and in this case, in order to give the optimal extrusion nature of the bushing pull wire 317, torque convectivity, and column intensity, two another art is used. A Nitinol wire about 0.010 inch in diameter is used for the 1st, and the distal end 319 of this wire is ground in a diameter suitable for formation of the after that of the extension member 309.
A Nitinol wire with a diameter suitable for formation of the expansion mechanism 309 is used for the 2nd art. In this case, the bushing pull wire 317 is covered in the suitable polymer jacket which is made from polyimide and has a diameter of about 0.005-0.0101 inch preferably. A

polymer jacket has the thick proximal edge 318, and a neck is formed by the distal end 319 of the bushing pull wire 317, and it is being fixed to the bushing pull wire 317 by suitable adhesives, such as Loctite (trademark), in the distal end and the proximal edge 303.
As shown in Fig. 18, the proximal edge 318 of the bushing pull wire 317 came out from the proximal edge 303 of the 1st flexibility elongated tube-like member 302, and has extended. Thereby, a disposition means is carried out like the after-mentioned, and can be operated by people's hand.

It will also be understood that not a bushing pull wire but a bushing pull element or a bushing pull mechanism can be used although disposition and disposition release of an extension member and an extended assembly are performed.
It establishes during disposition and disposition release of the extended assembly 307, the stop mechanism 321, i.e., the stopping means, which control the moving range of the bushing pull wire 317. The stop mechanism 321 has the 1st formed with a plastic or a suitable material like stainless steel, and the 2nd slidable stop tube 322 and 323 that was telescopic, namely, was attached in the shape of the same axle. The distal end of the 1st stop tube 322 is supporting the bush 324. The bush 324 is fixed to the distal end of the 1st stop tube 322 by a suitable means like adhesives (not shown). The proximal edge 318 of the bushing pull element 317 is attached to the 1st tube by a suitable means like adhesives. The bushing pull element 317 by which the 1st tube 322 was attached and the bush 324 was supported can move to the longitudinal direction of the 2nd tube 323 provided with the distal end fixed to the proximal edge of the elongated tube-like member 302. A bushing pull element is movable between the method position of the forefront which engages with the bush 324 or the proximal edge 303, and the annular solid 326 attached to the proximal edge of the 2nd tube 323 (the 1st tube 322 moves slidably through this tube) by a suitable means like adhesives. The length of the 1st tube 322 and the 2nd tube 323 is chosen so that the migration length between the method position of the forefront and the method position of the last may become a range which is 2-10 cm.
The extended assembly 307 has the flexible film 311 deformable again, and is supported by the distal end 304 of the 1st flexibility elongated tube-like member 302 like a graphic display, and is carried out like the after-mentioned, and can fix this film 311 to said distal end 304. Since it is preferred that this film 311 has dramatically large flexibility, it has 0.001-0.15 inch of wall thickness [about 0.004 inch of] preferably. The film 311 can be formed with suitable arbitrary flexible materials, such as an elastomeric material containing latex and silicone or a non-elastomeric material. The film 311 can be made from the permeable material which enables several use of impermeable material or a device.
One polyurethane elastomer [like 30-70A, Chemoprene (trademark) that has a shore hardness durometer (shore hardness durometer) of 55A preferably, or Polyblend (trademark)] whose satisfying film 311 is, It can make from Tecoflex (trademark) with 60-the shore hardness durometer of 100A, or Pellathane (trademark) with 70-the shore hardness durometer of 100A. Or the film 311 can be made from the multilayer which consists of a central Polyblend (trademark) layer with a thickness of about 0.005-0.010 inch, and a Tecoflex (trademark) layer of the thin outside with a thickness of about 0.0005 inch. This stratified film 311 is made by immersing Polyblend (trademark) into a Tecoflex (trademark) solution, for example, a Tecoflex(trademark) 85A solution. Like a graphic display, the film 311 has substantial impermeableness to blood and other fluids. The film 311 is formed as tubular SOx 333, and this SOx 333 has the almost cylindrical long and slender shape provided with one closed end 329 and the other end surrounded by the opening 331 formed of the rim 332 of the same material. length with within the limits of 2-15 mm suitable for tubular SOx 333 -- it has a length of 7 mm preferably. When made from Polyb-lend (trademark) cut by the length of the suitable size which the film 311 was generally tubular, and was supplied, and both ends opened wide, the closed end 329 of the film 311 is Polyblend (trademark).
A ****** part is preferably immersed into the 10-% of the weight solution of 85ATecoflex (trademark) among a Tecoflex (trademark) solution, and it is formed by making the sealing plug 327.

The rim 332 of the film 311 is fixable to the distal end 304 of the 1st flexibility elongated tube-like member 302 by a suitable method like Loctite 454 (trademark) adhesives (not shown) in a hoop direction.
The stainless steel hypo tube 328 of fixed length has an end fixed to the distal end 304 of the 1st flexibility elongated tube-like member 302 (refer to Fig. 18) using suitable adhesives like Loctite 406 (trademark). length with within the limits of 2-10 mm suitable for the hypo tube 328 -- it had a length of 5 mm preferably, was fixed to the 1st flexibility elongated tube-like member 302, and has extended in the distance side from the member 302 only by about 2-8 mm. The hypo tube 328 preferably the rim 332 of the film 311 from the position fixed to the 1st flexibility elongated tube-like member 302 by the distance side. It is attached to the outside of the stainless steel hypo tube 328, and as shown in Fig. 18, orientation of the closed end 329 of the film 311 is carried out to the distance side on the member 302. Although a part of film 311 by the side of the distance of the rim 332 is arranged on the steel hypo tube 328, it is not pasted up here. If it is a request, please care about that the rim 332 is directly fixed on the outside surface of the distal end 304. With any composition, the film 311 has SOx-like shape as shown in Fig. 18. Or it is fixable to the inside of the hypo tube 328, and the rim 332 of the film 311 can be fixed in the 1st tubular pore of the 1st flexibility elongated tube-like member 302, i.e., a supervisor hole, when not using the hypo tube 328. The film 311 is fixable to a Nitinol wire by the juxtaposition side of the extension member 309.
The non-transmission film 311 of the extended assembly 307 can be made into various shape which includes the shape of an even disk in Fig. 18 as a dashed line position shows. This operates the disposition mechanism 308, moves the bushing pull element 317 to the distance side, and is attained by pushing on the distance side so that it may come out of the extension member 309 from the tubular pore 306 and may enter in the film 311. The operator can assist disposition by giving slight rotation to the bushing pull element 317, when the bushing pull element 317 is moved to the distance side. If the extension member 309 passes the 1st tubular pore 306, it will begin to extend to the specified shape by which shape memory was carried out. The distance side turn 316 of the extension member 309 which makes the shape of a coil operates so that it may make the film 311 extend slightly first. A big distortion of the suddenly of the film 311 is prevented by this initial operation. If the extension member 309 comes out of the tubular pore 306, moves to the distance side and is extended in the film 311, for the lubricative surface of the stainless steel hypo tube 328, the non adhesion portion of the film 311 by the side of the distance of the rim 332 will begin to move preferentially, and will become even shape. Extension advances by the middle turn 314 which forms a coil and extends the film 311 to desired size (about 12 French). next, the juxtaposition side turn 313 which forms a coil -- shape -- a centering -- and it is made to stabilize and, thereby, the centering of the bushing pull element 317 is carried out to the middle turn 314 and the film 334 extended thoroughly. During extension of the extension member 309, the wrap film 311 restrains the coil 312 and reaction force, i.e., an offset shrinkage force, acts the coil 312 on the extended coil 312 which is trying to become the free shape 312 of the memorized congruence conical shape by this. In this way, the film 311 is not extended passively. Rather, the film 311 is made to extend compulsorily, and the extended coil 312 is substantially even, namely, makes the un-flat turns 313, 314, and 316 of the coil 312 the shape of a disk. At this time, the film 334 is stretched tightly, and is arranged at the both sides of the expansion mechanism 309, and forms the extended assembly 307. This extended assembly 307 becomes almost vertical to the longitudinal direction axis of the 1st flexibility elongated tube-like member 302, when it extends. When arranged, the expansion mechanism 309 has sufficient rigidity and forms the holding frame which maintains the film 311 in the state where it was stretched with the bottle.
It will be understood that a superelasticity extension member with various memory shape can be used as other embodiments. As mentioned above, since the permeability for various functions or an impermeable assembly is constituted, various charges of a film material can be used. The predictability of offset extension power and resistance film power can constitute an extended assembly with predetermined disposition shape. A Nitin-ol member is fixable to the wire which maintains a state of rest instead of sliding a bushing pull wire. According to such an embodiment,

an extension member and a wire are accommodated in the elongated tube-like member by which the SOx-like film was attached to the distal end, and, thereby, an elongated tube-like member is arranged in a film by sliding a sheath on the juxtaposition side.
Operation of the device 301 and directions for use resemble very well the operation and directions for use which described the embodiment of the closing appliance 21 except for the following point of difference. Biological sealant is not used for the growth equipment 301 shown in Fig. 18 and Fig. 19. In this way, after contacting the extended assembly 307 to the distal end of the site of puncture 106, it is preferably maintained by the extended assembly 307 from for 30 minutes from for 2 minutes for 1 hour for several hours until the seal of the site of puncture 106 is carried out, the tensile force, i.e., the traction, to a proximal side direction. By moving the extended assembly 307 from an arrangement position, i.e., an extended position, to a non-arrangement position, i.e., a contraction position, tensile force is released and the device 301 is removed as mentioned above after that.
The 2nd point of difference is that the radiopacity of the expansion mechanism 309 is determined with the shape of the coil 312. When the coil 312 is in the shape of non-restraining memory congruence conical shape, since and and shape where the size of each turn of a Nitinol wire is small are not even, a coil cannot be recognized visually with X-ray fluorography. While making the shape of a disk with the expansion mechanism 309 even within the film 334, the accumulation density of a Nitinol turn can be recognized visually with X-ray fluorography. As mentioned above, this is also the easy method of carrying out check formation of the good seal between the extended assembly 307 and the wall 103 of the blood vessel 107.
Since the device 301 is small, when a blockade is insufficient, and bleeding continues or other complicated situations occur, it can reintroduce into the blood vessel 107 using the introductory sheath 111. For example, an operator assumes that thinks that the seal of the site of puncture 106 was carried out after removal of the sheath 111, therefore disposition release of the extended assembly 307 is carried out as mentioned above. Then, when an operator observes the continuation bleeding from the site of puncture 106, an operator can be reintroduced into the blood vessel 107 by loosening tensile force, and extruding the 1st flexibility elongated tube-like member 302 to the distance side, and carrying out reinsertion of the sheath 111 into the blood vessel 107 on this member 302. An operator can be reintroduced into a blood vessel for other medical purpose if needed. The same approach is made, when the film 311 explodes or the extended assembly 307 carries out a certain failure. In this case, the sheath 111 is exchanged as mentioned above and the growth equipment 301 of failure is exchanged promptly.
The giving-tensile-force machine 335, i.e., catheter holding mechanism, is formed, and this catheter holding mechanism 335, Engage with the elongated tube-like member 302 and it acts on this member 302 so that release of tension is possible, Engagement to the arranged extended assembly 307 and the blood vessel wall 103 in which the site of puncture 106 was formed is maintained, and since the device 301 is held after the device 301 is correctly arranged in the site of puncture 106, the hand of an operator is freed. The catheter holding mechanism 335 covers the fixed moving range of the flexible elongated tube-like member 302 produced as a result of a patient's movement or an initial position arrangement, and applies the predetermined, almost fixed power of a proximal side direction to the extension member 309.
The tension giving device 335 is shown in Fig. 20 – Fig. 23, and this tension giving device 335 has the fastener 336, i.e., a pars basilaris ossis occipitalis. As the pars basilaris ossis occipitalis 336 comprises a suitable material like a transparent plastic and it is shown in Fig. 20, It consists of the base plate 337 with suitable shape, size, for example, shape without the West, and size, and is laid on the skin 101 on the site of puncture 106 within the wall 103 which forms the lumen 107. The fastener 336 had the front wall 338 and the posterior wall of stomach 339 further, and these walls are prolonged up it is desirable and almost right-angled from the surface of the base plate 337. the posterior wall of stomach 339 -- true -- it has the direct outside surface 342 and the inclined inner surface 343.
the front wall 338 -- true -- it has the direct inner surface 344 and the outside surface 346. the crowning of the posterior wall of stomach 339 of the base part 336 -- the swinging arm 347, i.e., a crowning, -- hinge connection -- namely, it is pivoted and can move now between an open

position and a closed position to the base part 336. an open position -- the crowning 347 -- the angle to 336 receive 180 degrees of base parts -- the angle of 45 degrees is occupied preferably. The crowning 347 appears on the base part 337 mostly, and becomes parallel to the base part 337 in a center valve position, i.e., a closed position. However, the crowning 347 can perform at least 0.5-cm addition movement in the both directions of the direction which separates from the closed direction and an open direction, the direction that goes to the base part 336, respectively, and the base part 336, i.e., addition movement, like the after-mentioned in a closed position.

By the spring means which covers a fixed position range and can give almost fixed prescribed tension, hinge connection is carried out and the arm 347 is energized so that it may be pushed in the direction which separates from the skin of an open position, i.e., a patient. The crowning 347 and the pars basilaris ossis occipitalis 336 of the tension giving device 335 are making a dress structure provided with the living hinge 348 formed by establishing a muscle or a slot in a plastic. Or metal or other hinges can be used and a separate crowning and pars basilaris ossis occipitalis can be combined. As mentioned above, it is preferred to use the spring of certain force like the coil spring 349 which can give suitable fixed tension. For example, please care about that the spring of the arbitrary kinds which can give the above-mentioned fixed tension like a blade spring, flat spring, a spiral spring, a helical spring, a belleville spring, and a spiral spring can be used.

It is supported by the arm 347 as shown in Fig. 20, the catheter clamp device, i.e., the holding means, which make the gestalt of the gripping member 351.

This clamp device is movable between an open position, i.e., a release position, and a closed position, i.e., a clamp location.

The gripping member 351 is making the gestalt of the serrated pad which comprised a plastic, rubber, or a suitable material like metal. The gripping member 351 is supported by the distal end of the flexible thin long curve spring member 352, i.e., a spring arm. The arm 352 comprises a plastic or a suitable spring material like metal, and is arranged in the crevice 350 of the casing of the crowning 347. The proximal edge of the spring arm 352 is arranged at the both sides of the pin 352 attached by separating an interval so that this proximal edge of each other might be pressed toward a clamp location.

The means which overcomes the thrust of the spring arm 352 is formed, and this means has the actuator button 354 with a flange slidably attached in the hole. It is being fixed to the button 354, and that it should engage with the spring arm 352 (Fig. 21) of an opposite hand, it shifted mutually and the actuator arm 355 is prolonged, and thereby, the spring arm 352 is moved so that it may separate in order to move the gripping member 351 to an open position.

If it consistents when the slots 356 and 357 are formed in the fixed portion 337 and the arm part 347 and these slots have the arm 347 in a closed position, and grasped by the gripping member 351, the 1st elongated tube-like member 302 or the main part 362 will be arranged in this closed position.

The operation of the tension giving device 335 is explained in relation to Fig. 21 - Fig. 23. As shown in Fig. 22 and Fig. 23, the fastener 336 is applied to a patient's skin. By pushing aside the arm 347 in the direction of the fastener 336 until the arm 347 is juxtaposed by the base plate 337, opening the spring arm 352, and grasping the 1st flexibility elongated tube-like member 302 or the elongated tube-like main part 362, the tension giving device 335 is set up or energized -- the fixed juxtaposition side tension with the tension giving device 335 suitable by this -- the tension within the limits of 0.25-3 pounds is maintained [the total displacement range] preferably. It tries for the power applied to the 1st flexibility elongated tube-like member 302 to pull out the member 302 from the site of puncture 106 within the wall 103 of the blood vessel 107, and, thereby, the growth equipment 302 is held at the state where it engaged with the wall 103 of the blood vessel 107.

Both marks are mutually adjusted, when the distinguishing mark of the gestalt of the arrow 358 is provided in the fastener 336 and the arm 347, and the tension giving device 335 is positioned correctly and it is energized as mentioned above in a neutral closed position. Or the visualization which lets the base plate 337 of a transparent plastic pass can be operated as a displaying

means.
It should care about that other embodiments of a tension giving device can be used for this invention, without deviating from the novelty and the use to mean of this invention. For example, the holding means can consist of the same unsymmetrical members and arms as pin vice or a clamp. According to such an embodiment, it energizes [spring-] namely, presses [spring-] at the position in which one holding arms are slidably arranged in the holding arms of another side, and one gripping member is juxtaposed by the gripping member of another side. Or two holding arms are selectively divided along the longitudinal direction axis, and can consist of single arms which form the arm which spreads outside.
The gripping member can also consist of clamps which fit in namely, move into a closed position with ******. Similarly, the arm had length shorter than a pars basilaris ossis occipitalis, and the gripping member and the arm are prolonged exceeding the pars basilaris ossis occipitalis. Please care about that the giving-tensile-force machine 335 can be used for other catheters.
The tension giving device 335 provided with the indicator also has again the function to check formation of the good blockade seal of the site of puncture 106 using the extended assembly 307. The arranged extended assembly 307 bears, the power, i.e., the tension, by the side of the above-mentioned juxtaposition, and a blockade seal is maintained unless the arranged coil 312 and the disk-like film 334 change shape by this. For example, when the film 311 explodes, the coil 312 can become the shape 312 of that memorized congruence conical shape again, and this shape cannot maintain high tension, and it can be incompatible with the blockade of a site of puncture. Loss of tension will warn of the indicator of the tension giving device 335 having been energized, prescribed tension having been released by the operator, and sufficient seal lacking.
Other embodiments of growth equipment are shown in Fig. 24. Although the growth equipment 360 has the main points of difference at the point constituted so that a means to introduce biological sealant might be formed in the site of puncture by the side of the juxtaposition of an expansion mechanism and the seal of the site of puncture might be carried out, it resembles very well the growth equipment 360 shown in Fig. 18. Therefore, the same reference number is used for all the parts of the growth equipment 301 which exists in the growth equipment 360. The biological sealant introduction means 361 is supported by the flexible elongated tube-like main part 362 which consists of the 1st and 2nd flexibility elongated tube-like members 302 and 363. The 1st flexibility elongated tube-like member 302 is mentioned above. The 2nd flexibility elongated tube-like member 363 is formed by suitable plastic material and an extrusion thermosetting elastomer like Pebax (trademark) which has a shore hardness durometer of 50D or 72D preferably. The 2nd flexibility elongated tube-like member 363 has the wall 367 which forms the tubular pore 368 which had the proximal edge 364 and the distal end 366, and was prolonged along the longitudinal direction axis, and has been prolonged from the proximal edge 364 to the distal end 366. The tubular pore 368 has a larger diameter than the outer diameter of the 1st flexibility elongated tube-like member 302. The 1st flexibility elongated tube-like member 302 is arranged in the tubular pore 368 of the 2nd flexibility elongated tube-like member 363 at arrangement, i.e., a nesting type, and by this, The 1st hoop direction space 369, i.e., annular space, is formed between the outside surface of the 1st flexibility elongated tube-like member 302, and the wall 367 of the 2nd flexibility elongated tube-like member 363.
The termination of the distal end 366 of the 2nd flexibility elongated tube-like member 363 is adjoined and carried out to the expansion mechanism 309 by the juxtaposition side of the distal end 304 of the 1st flexibility elongated tube-like member 302.
The 2nd flexibility elongated tube-like member 363 has a suitable length of 10-160 cm, for example with suitable size, for example, the outer diameter of 0.020-0.050 inch, and an inside diameter of a tubular pore of 0.015-0.040 inch, i.e., a diameter. As mentioned above, the distal end 366 of the 2nd flexibility elongated tube-like member 363 is a juxtaposition side (from 1-15 mm to for example, several centimeter juxtaposition side) of the distal end 304 of the 1st flexibility elongated tube-like member 302, and the termination is adjoined and carried out to the expansion mechanism 309.
As a juxtaposition side adapter for performing sealant introduction into the flexible elongated tube-like main part 362, there is a suitable T adapter or a Y adapter. Preferably, as shown in Fig.

24, the T adapter 375 has the end fixed to the proximal edge 364 of the 2nd flexibility elongated tube-like member 363 using suitable adhesives. At the 2nd end of the T adapter 375, the compression fitting 376 for accommodating the proximal edge 303 of the 1st flexibility elongated tube-like member 302 which has been arranged in the T adapter 375 and has been prolonged in the juxtaposition side from here is supported. The compression fitting 376 makes it possible to remove the 2nd flexibility elongated tube-like member 363, forming the disclosure-proof connecting part between the 1st flexibility elongated tube-like member 302 and the 2nd flexibility elongated tube-like member 363, and maintaining the 1st flexibility elongated tube-like member 302 to an arrangement position. Introduction of sealant is performed via the proximal edge 364 of the 2nd flexibility elongated tube-like member 363, and the fluid port 377 open for free passage, as shown in Fig. 22. The matching diaphragm 378 which carries out vision consistency of the marker 379 on the proximal edge 303 of the 1st flexibility elongated tube-like member 302 or the proximal edge 318 of the bushing pull wire 317 is formed in the T adapter 375.
Thereby, as mentioned above, by the juxtaposition side of the distal end 304 of the 1st flexibility elongated tube-like member 302, the distal end 366 of the 2nd flexibility elongated tube-like member 363 adjoins the expansion mechanism 309, and is positioned suitably.

Operation of the device 360 and directions for use are the same as the operation and directions for use which explained the growth equipment 301 except for the point which can introduce biological sealant into a device.
As soon as a good seal is formed between the walls 103 contiguous to the blockade assembly 307 and a site of puncture, the operator can introduce the ingredient of biological sealant in the fluid port 377 of the adapter 375 as mentioned above. Sealant Next, the inside of the proximal edge 364 of the 2nd flexibility elongated tube-like member 363, And it is introduced in the 1st space 369 between the outside surface of the 1st flexibility elongated tube-like member 302, and the wall 367 of the 2nd flexibility elongated tube-like member 363, and comes out from the part which adjoined the expansion mechanism 309 by the juxtaposition side of the distal end 304 of the 1st flexibility elongated tube-like member 302 from here. Other operations of the device 360 are the same as the operation mentioned above about the directions for the device 21 and the device 301.
Other embodiments of the growth equipment which introduced this invention are shown in Fig. 25 and Fig. 26. The growth equipment 401 resembles very well the growth equipment shown in Fig. 24 except for the biological sealant means used for this device 401 having the main points of difference. In this way, the same reference number is used for all the parts of the growth equipment 360 which exists in the growth equipment 401. Although the biological sealant means 402 is the same as the biological sealant means of Fig. 24, The main points of difference have the flexible elongated tube-like main part 362 in having the 3rd flexibility elongated tube-like member 403 formed by still more suitable plastic material and an extrusion thermosetting elastomer like Pebax (trademark) which has the durometer hardness of 63D or 72D preferably. The 3rd flexibility elongated tube-like member 403 had the proximal edge 404 and the distal end 406, and is prolonged along the longitudinal direction axis.
And it has the wall 407 which forms the tubular pore 408 which is prolonged from the proximal edge 404 to the distal end 406, and has a larger diameter than the outer diameter of the 2nd flexibility elongated tube-like member 363.
The 2nd flexibility elongated tube-like member 363 is arranged in the tubular pore 408 of the 3rd flexibility elongated tube-like member 403 at arrangement, i.e., a nesting type, and, thereby, forms the 2nd hoop direction space 409, i.e., annular space, between the walls 407 of the 2nd flexibility elongated tube-like member 363 and the 3rd flexibility elongated tube-like member 403. The distal end 406 of the 3rd flexibility elongated tube-like member 403, From the distal end 304 of the 1st flexibility elongated tube-like member 302, from the distal end 366 of the 2nd flexibility elongated tube-like member 363, are a distance side, and carry out a termination to the position by the side of a juxtaposition, and by this, The annular distance side mixing chamber 411 is formed between the walls 407 of the 1st flexibility elongated tube-like member 302 and the 3rd flexibility elongated tube-like member 403.

The 3rd flexibility elongated tube-like member 403 has suitable size, for example, the outer diameter of the range of 0.030-0.070 inch, and a suitable length of 10-160 cm. As mentioned above, from the distal end 366 of the 2nd flexibility elongated tube-like member 363, the termination of the distal end 406 of the 3rd flexibility elongated tube-like member 403 is carried out to the 5-mm distance side, and, thereby, a distance side forms the distance side mixing chamber 411 preferably 1-15 mm, for example, the distal end 406 of the 3rd flexibility elongated tube-like member 403 -- again -- the distal end 304 of the 1st flexibility elongated tube-like member 302 -- the juxtaposition side (from 1-15 mm to for example, several centimeter juxtaposition side) -- and a termination is adjacently carried out to the expansion mechanism 309. In order to obtain this shape, the 2nd flexibility elongated tube-like member 363 is made into suitable length slightly shorter than the length of the 2nd flexibility elongated tube-like member 363 of the device 360.
The juxtaposition side adapter (proximaladaption) which introduces sealant is formed in this three flexible elongated tube-like member body. It can do [carrying out separation **** removal of the 2nd flexibility elongated tube-like member 363 or the 2nd and 3rd flexibility elongated tube-like members 363 and 403 reversibly by this, or]. By removal of the 2nd flexibility elongated tube-like member 363, access to bigger space than that between the 1st flexibility elongated tube-like member 302 and the 3rd flexibility elongated tube-like member 403 is obtained, and more reliable suction can be tried. By removal of both the 2nd flexibility elongated tube-like member 363 and the 3rd flexibility elongated tube-like member 403, use of the above isolated type growth equipment 301 can be performed, and can wash the removed tubular member if needed.
As a juxtaposition side adapter of the device 401, there are suitable above T adapters and a Y adapter. The juxtaposition side adapter 375 of the 2nd flexibility elongated tube-like member 363 is the same as the juxtaposition side adapter 375 of the 2nd flexibility elongated tube-like member 363 of the device 360. The 3rd flexibility elongated tube-like member 403 supports the same juxtaposition side adapter 412 that makes the gestalt of the T adapter 412, the compression fitting 413, and the fluid port 414, and This sake, As mentioned above, the 2nd flexibility elongated tube-like member 363 is arranged in the 3rd flexibility elongated tube-like member 403 at arrangement, i.e., a nesting type, and forms the fluid seal juxtaposition side seal between two members. The 2nd sealant, i.e., the ingredient, is introduced like the after-mentioned in the fluid port 414 of the compression fitting 413 of the 3rd flexibility elongated tube-like member 403.
The juxtaposition side adapter 412 of the 3rd flexibility elongated tube-like member 403 is supporting the matching diaphragm 416, Thereby, an operator enables it to adjust the marker 17 of the 2nd flexibility elongated tube-like member 363 by vision within the window 416, and, for this reason, the 2nd and 3rd flexibility elongated tube-like members 363 and 403 of each other can be positioned suitably while in use. Please care about that the 2nd and 3rd flexibility elongated tube-like members 363 and 403 are constituted as a single unit, and it can constitute by this so that only a unit can insert and remove on a 1st flexibility elongated tube-like member.
Operation of the device 401 and directions for use are the same as the operation and directions for use which explained the growth equipment 360 except for the directions for the biological sealant means 402 of the device 401. As soon as a good seal is formed between the walls 103 contiguous to the blockade assembly 307 and a site of puncture, a doctor, The ingredient of biological sealant The inside of the fluid port 377 of the adapter 375 of the proximal edge 364 of the 2nd flexibility elongated tube-like member 363, It can introduce in the 1st space 369, respectively in the fluid port 414 of the adapter 412 of the proximal edge 404 of the 3rd flexibility elongated tube-like member 403, and the 2nd space 409, and the ingredient of sealant can be independently moved into a mixing chamber at the distance side. An ingredient is well mixed within a mixing chamber and the mixed sealant comes out of the position which is a juxtaposition side and adjoins the expansion mechanism 309 from the distal end 304 of the 1st flexibility elongated tube-like member 302. Other operations of the device 401 are the same as the operation mentioned above in relation to use of the device 21.
Other embodiments of the growth equipment which introduces this invention are shown in Fig. 27

– Fig. 30. The growth equipment 418 also resembles very well the growth equipment shown in Fig. 24 except for the biological sealant means 419 used for this device 418 having the main points of difference. In this way, all the parts of the growth equipment 360 which exists in the growth equipment 418 are shown by the same reference number.
As shown in Fig. 27, this 2nd tubular pore 425 that the addition tubular pore 425, i.e., the 2nd tubular pore, is formed in the 2nd flexibility elongated tube-like member 363 of the device 418, and has a semicircular-shapes section has been arranged in the side of the 2nd flexibility elongated tube-like member 363, and is prolonged from the proximal edge 364 to the distal end 366. Since the 2nd flexibility elongated tube-like member 363 can support the 2nd tubular pore 425, the 1st tubular pore 368 can also be arranged to the side. The 2nd tubular pore 425 has the suitable angular distance within the limits of 0.020-0.040 inch.
The 2nd tubular pore 425 of the device 418 is applicable to introduction of biological sealant, as it mentioned above in relation to the device 360. The 2nd tubular pore 425 is used for trying suction in order to check formation of the good seal between the extended assembly 307 and the wall 103 of the blood vessel 107, as it mentioned above in relation to the device 21 again.
The 3rd flexibility elongated tube-like member 430 which equipped the growth equipment 418 with the proximal edge 431 and the distal end 432 again, and has been prolonged along the longitudinal direction axis is formed. As shown in Fig. 27, Fig. 28, and Fig. 30, the 3rd flexibility elongated tube-like member 430 has the size and shape which are reversibly arranged by friction engagement in the 2nd tubular pore 425 of the 2nd flexibility elongated tube-like member 363. And it has length almost equal to the length of the 2nd flexibility elongated tube-like member 363.

It has inner substance structure as the 3rd flexibility elongated tube-like member 430 similarly formed with suitable plastic material like Pebax (trademark) and shown in Fig. 28, Thereby, the 3rd flexibility elongated tube-like member 430 functions as a callus of the 2nd tubular pore 425 of the 2nd flexibility elongated tube-like member 363, and it is maintained in the state where this 2nd tubular pore 425 is not blockaded until use preparation of the 2nd tubular pore 425 is completed.
Another 3rd flexibility elongated tube-like member 433 is formed, and this member 433 has the same size and shape, and it functions as a biological sealant introduction means. As shown in Fig. 27 and Fig. 30, this another 3rd flexibility elongated tube-like member 433 is supporting the 1st tubular pore 434 and the 2nd tubular pore 436, and each tubular pore is prolonged from the proximal edge 431 of another 3rd flexibility elongated tube-like member 433 to the distal end 432. The mixing chamber 437 formed of this juncture succeeding the distance side juncture of the 1st tubular pore 434 and the 2nd tubular pore 436 is supported by the distal end 432 of the 3rd flexibility elongated member 433. As another composition, without [instead] establishing the distance side juncture of the above-mentioned tubular pore in the 3rd flexibility elongated member 433, it can be made length slightly shorter than the length of the 2nd flexibility elongated tube-like member 363, and the mixing chamber 437 can be formed in the distal end 366 of the 2nd flexibility elongated tube-like member 363.
As shown in Fig. 27, the juxtaposition side adapter 438 which performs sealant introduction into this 3rd flexibility elongated member 433 is formed. The proximal edge 431 of the 3rd flexibility elongated member 433 is supporting, the fitting 438, i.e., an adapter, provided with the 1st tubular pore 434 of the 3rd flexibility elongated member 433 and the 2nd tubular pore 436, and the two adjusted fluid ports 439 or more. The fitting 438 comprises suitable materials, such as polycarbonate, a plastic like Isoplast (trademark), or nylon, for example, and is joined to the 3rd flexibility elongated member 433 by suitable adhesives. Or the adapter 438 can be constituted from Pebax 82D (trademark), and thermal melting arrival can be carried out to the proximal edge 431 of the 3rd flexibility elongated member 433. The adapter 438 can be constituted so that it can connect with the 3rd flexibility elongated member 433 reversibly.
Operation of the device 418 and directions for use are the same as the operation and directions for use which were mentioned above in relation to the device 401. The ingredient of biological sealant is introduced in the adapter 438 from the juxtaposition side, then, is introduced in the 1st

and 2nd tubular pores 434 and 436, moves an ingredient independently into the distance side mixing chamber at the distance side, and is fully mixed within a mixing chamber. Then, the mixed sealant comes out of the position which adjoined the expansion mechanism 309 by the juxtaposition side from the distal end 304 of the 1st flexibility elongated tube-like member 302.
As another composition, as shown in Fig. 31 and Fig. 32, the 3rd flexibility elongated tube-like member 450 is formed. This 3rd flexibility elongated tube-like member 450 is the same structure as the another above-mentioned 3rd flexibility elongated member except the point that shape is tubular. This 3rd flexibility elongated tube-like member 450 also has the size by which friction engagement is carried out into the 2nd tubular pore 425 of the 2nd flexibility elongated tube-like member 363. In this case, the field of the 2nd tubular pore 425 of the 2nd flexibility elongated tube-like member 363 which surrounds the 3rd flexibility elongated tube-like member 450 is used as the 2nd space 451 where biological sealant is introduced like the after-mentioned.
As shown in Fig. 31, the juxtaposition side adapter for introducing sealant is formed in the 2nd tubular pore 425 of the 2nd flexibility elongated tube-like member 363 and the 3rd flexibility elongated tube-like member 450. The proximal edge 364 of the 2nd flexibility elongated tube-like member 363 is supporting, the fitting 452, i.e., the adapter, which comprised same mode as the above-mentioned mode. The adapter 452 has the proximal edge 453 and the distal end 454, and is supporting the tubular pore 456 from which the shape which penetrated this and has been prolonged changed. The distal end 454 of the adapter tube hole 456 has the 2nd tubular pore of the 2nd flexibility elongated tube-like member 363, the size to adjust, and shape. The proximal edge 453 of the adapter tube hole 456 has the size which has a circular section and accepts the 3rd flexibility elongated tube-like member 450 in friction.
The fluid port 457 is connected with the adapter tube hole 456. As shown in Fig. 31, the proximal edge 431 of the 3rd flexibility elongated tube-like member 450 is also supporting the fluid port 458. The length of the 3rd flexibility elongated tube-like member 450 is more slightly [than the 2nd flexibility elongated tube-like member 363] short, and forms the above-mentioned distance side mixing chamber 437. Operation and directions for use are as having mentioned above.
As another composition, the 3rd tubular pore (not shown) prolonged from the proximal edge to the distal end is provided in the 2nd flexibility elongated member of growth equipment instead of using the 3rd flexibility elongated member. The mixing chamber is formed succeeding the distance side juncture of the 2nd tubular pore and the 3rd tubular pore, and this mixing chamber is supported by the distal end of the 2nd flexibility elongated tube-like member. As mentioned above, the juxtaposition side adapter and handle assembly for sealant introduction can be used. Operation and directions for use are as having mentioned above.
As mentioned above, the growth equipment, i.e., the closing appliance, and the method for performing endermic access which needs to be arranged in a human body by medical aid, and the blockade of a site of puncture were provided so that clearly. By changing the size and material of the free shape of the extension member of a superelastic alloy, and a film, The predetermined shape of an extended assembly and rigidity can be changed, and, thereby, sites of puncture, such as pleura fistula containing the fistula between a laparoscope site of puncture, a thoracic duct site of puncture, the bile duct way of the intestinal tract fistula, an intestinal tract, and the stomach, etc., and the living body pipeline in various positions of a human body can be blockaded. An extended assembly establishes the distance side boundary of a site of puncture, and exact arrangement is attained by this and it prevents the plug of sudden intravascular pouring and biological sealant. The growth equipment of this invention enables use of the ** biological sealant which forms a clot with intensity higher than the living body clot which the fibrin glue is used, for example and is formed with a human body. Even if the patient is medicated with the anticoagulant between front medical aid, the anticoagulation system of the living body of a human body can be made to bypass. Although the fibrin glue was discussed as main biological sealant, Other sealant (these all are not pasted up on growth equipment), such as collagen, Avitene (trademark) slurry, Gel Foam (trademark), fibrin, thrombin, and a thrombin mixture, can also be used. Each ingredient of multicomponent sealant is independently introduced in the annular space of the versatility of the growth equipment which consists of three flexible elongated tube-like members. By using the annular distance side mixing chamber, ingredient

versus constituent fluid contact becomes the minimum. The optimal mixing and hardening in the part needed as a touch area is the maximum of sealant are made. Good distribution is acquired by hoop direction introduction of the mixed biological sealant to a site of puncture. Probably, it will also be clear that other sealant introduction means to a flexible elongated tube-like member can be used. For example, before the introduction to a flexible elongated tube-like member, multicomponent sealant like the fibrin glue is also mixable.

The operation which helps for the shape of the expansion mechanism used for the growth equipment of this invention which contacts the inner surface of the wall in which a site of puncture is formed to hold in the state where the usual pressure of the arterial blood style contacted the wall in the extended assembly is carried out. Even if an extended assembly has small size and it is arranged in a blood vessel, the problem of the ischemia which makes it possible to continue flowing, without barring a blood flow through a blood vessel between expanding treatment, therefore accompanies a congestion, and a plug is avoidable. Since size is small, it can also be prevented that an extended assembly collides with the wall of the opposite hand of a blood vessel during disposition of a device or disposition release or that this receives damage.

In order for the growth equipment and the method of this invention not to need the disposition in a prolonged blood vessel of a foreign matter like collagen, an arterial anchor, or a suture and also not to use the balloon art accompanied by a burst or a risk of splitting of a balloon, Invasion of the particles to the inside of the danger of a life and a limbs sense-of-urgency stain (limb threatening infections) and a blood flow or an air bacteria lump is reduced substantially.

The catheter cage and giving-tensile-force machine of this invention give the fixed juxtaposition side tension to the arranged device. The peculiar safe feature is covering a moving range fixed as mentioned above, and being able to give fixed tension. Since manual application-of-pressure / clamp device currently used traditionally by this becomes unnecessary, it also becomes unnecessary that the health care professionals who do other work escort.

Since the blockade of a site of puncture using the growth equipment and the method of this invention can be performed promptly, it assists a patient's early walk being attained and avoiding traditional problems, such as an artery and vein fistula, pseudoaneurysm, thrombosis, and an embolism. Generally, since a device is discarded after 1-time use, the danger of the sick infection to a patient's blood flow is reduced substantially. Therefore, the medical cost to a patient and society is also reduced.

Although it explained using the growth equipment and the method of this invention mainly for a human body, growth equipment and a method should care about that it can be used in the same mode also as an animal.

It will also be understood that the growth equipment of this invention is used in the living body pipeline of everything but a human body, and other therapeutic or prophylactic application can be performed.

As mentioned above, it is clear that the growth equipment and the method with the strong point outstanding compared with the growth equipment and the method which are provided conventionally by this invention of performing endermic access to the site of puncture of a human body and the blockade of a site of puncture are provided.

The endermic method is art which can perform diagnosis to the organ of a human body, and therapy access, which bloody was small, was safe and was excellent in cost validity and which is performed by continuing broadly. However, in order to realize the strong point of endermic access thoroughly, the pathosis which accompanies an access part must be forestalled and it must prevent as much as possible. The newest therapeutic intervention has actually caused the wide range access part problem. The patient who wears such a problem has to receive invasive treatment often more in order to prevent the serious damage exerted on a life or the limbs. Such treatment brings about additional danger and cost. The effective endermic blockade of endermic blood vessel access it is proved to be that management is difficult is a big result. If such treatment is not used, many strong points of endermic diagnosis and curative treatment will be lost. Until now, the satisfying solution did not exist in conventional technology. The device and method of this invention can abolish many morbid side effects which accompany the above-

mentioned site of puncture.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]

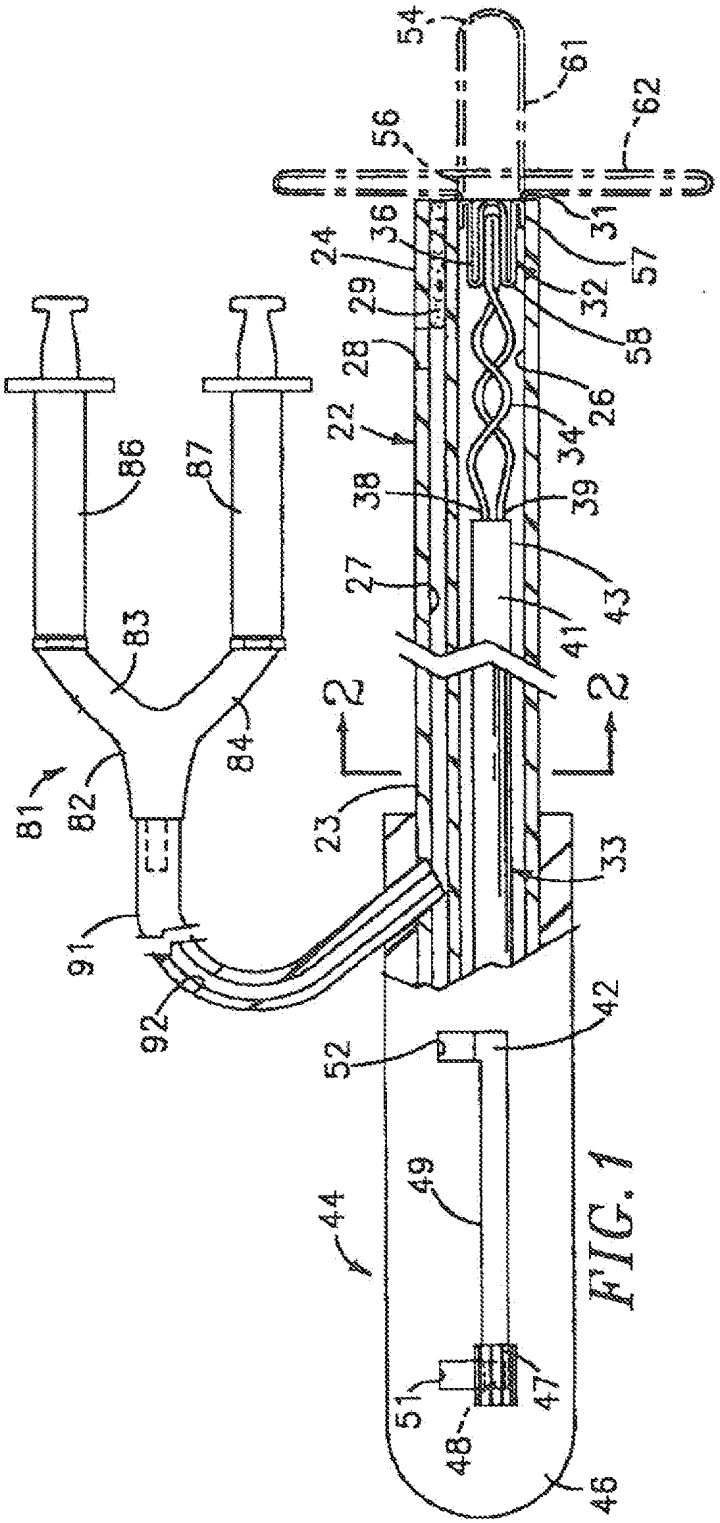

FIG. 1

[Drawing 2]

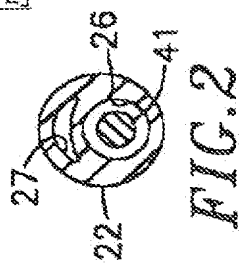

FIG. 2

[Drawing 3]

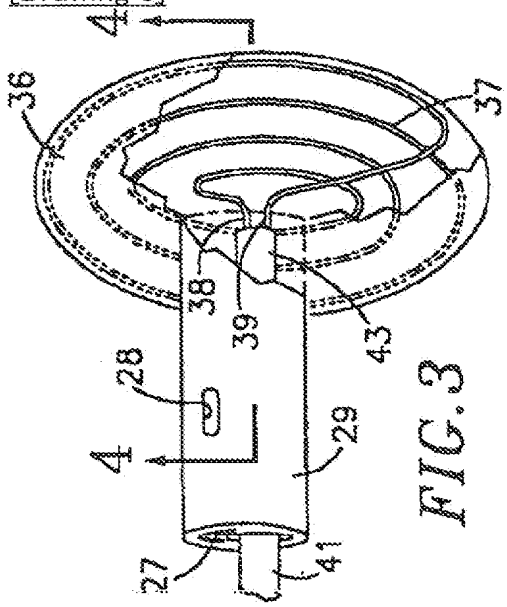

FIG. 3

[Drawing 4]

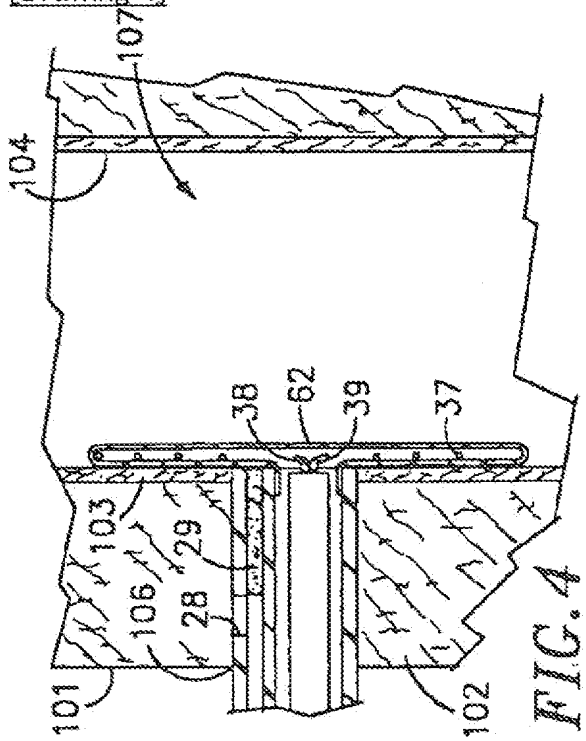

FIG. 4

[Drawing 6]

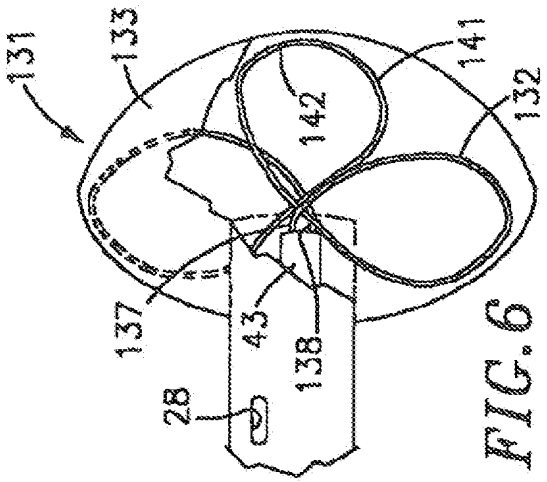

FIG. 6

[Drawing 5]

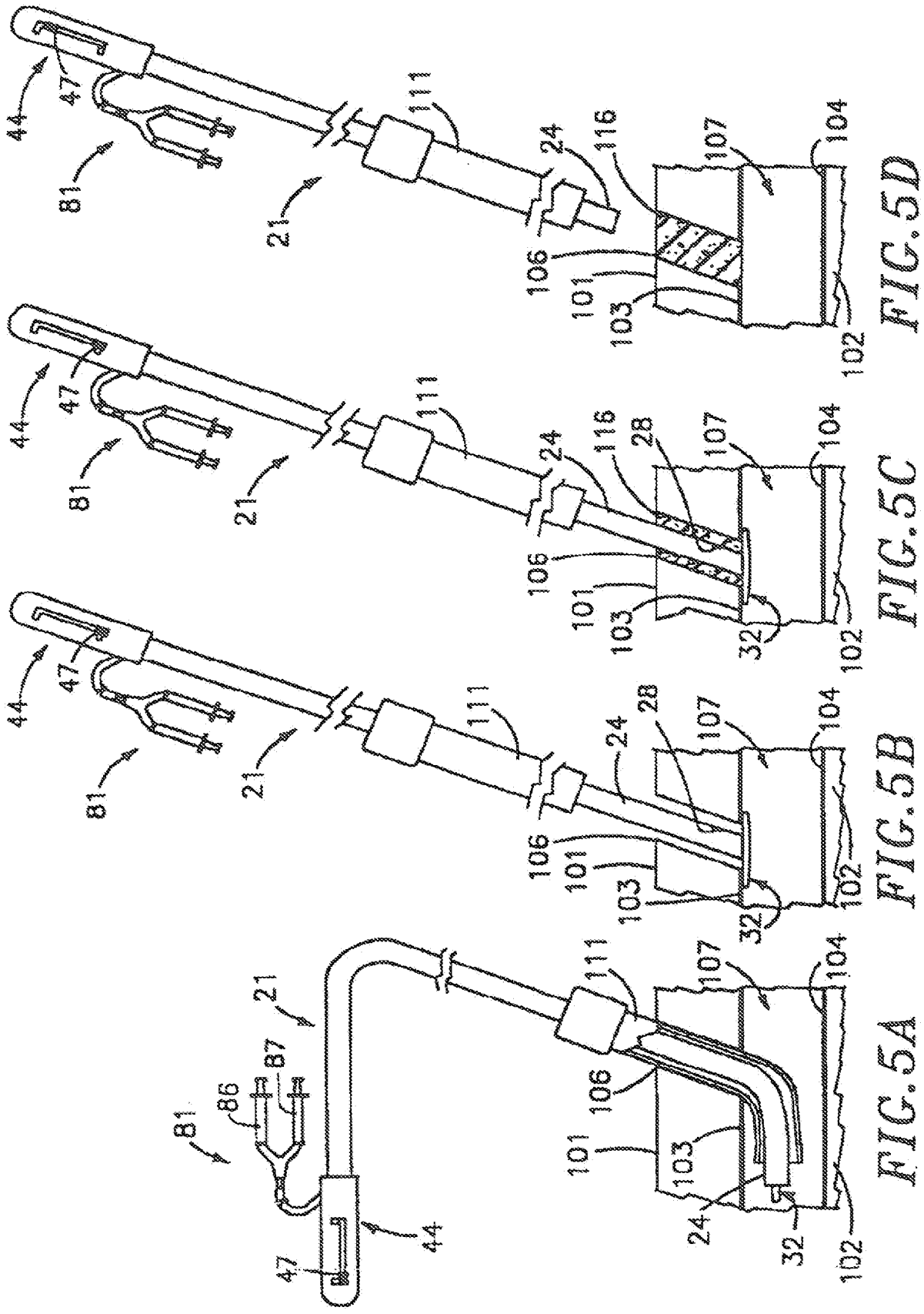
44
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FIG.5D
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FIG.5C
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32
102
FIG.5B
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47
FIG.5A

[Drawing 7]

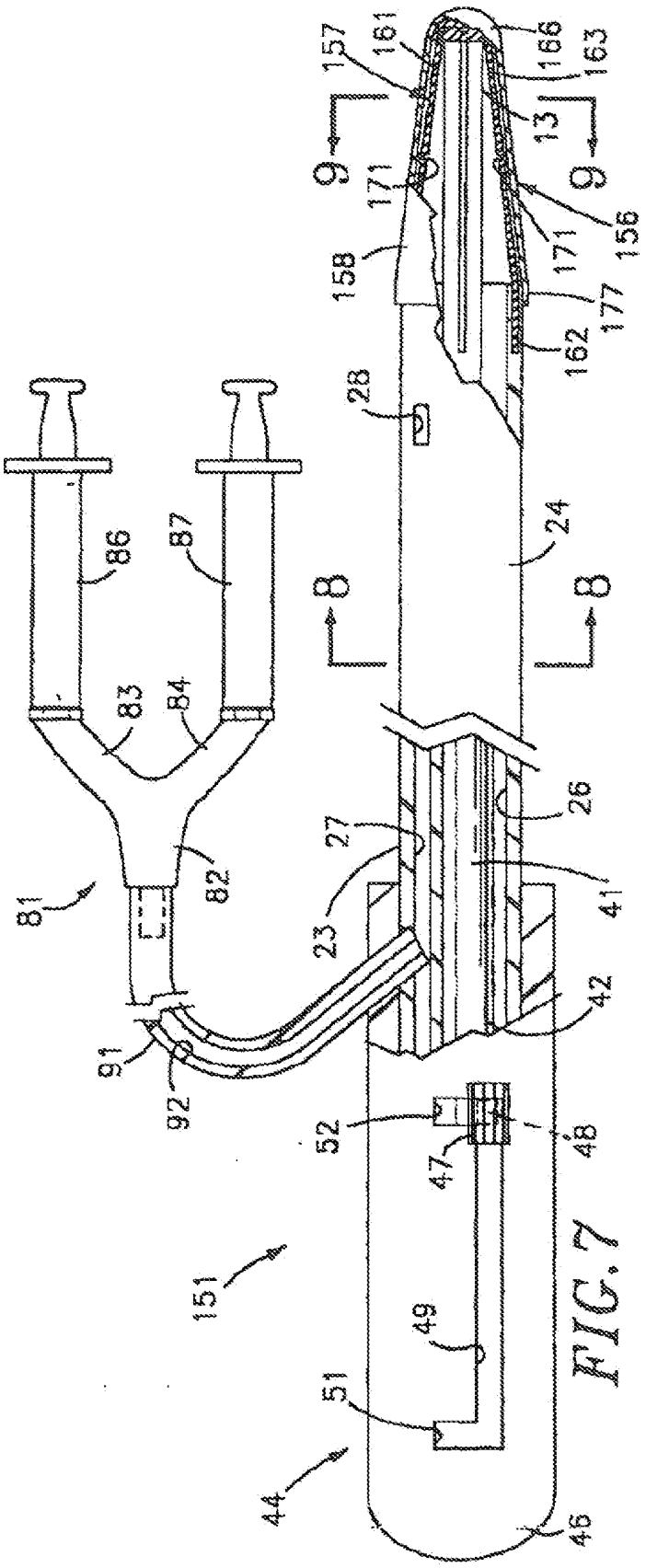

FIG. 7

[Drawing 8]

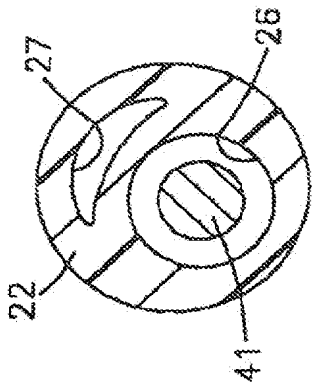

FIG. 8

[Drawing 9]

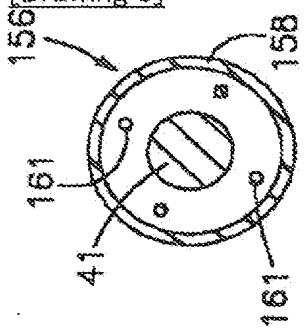

FIG. 9

[Drawing 10]

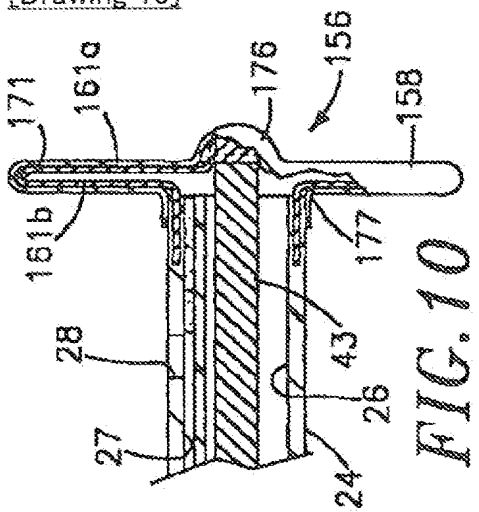

FIG. 10

[Drawing 11]

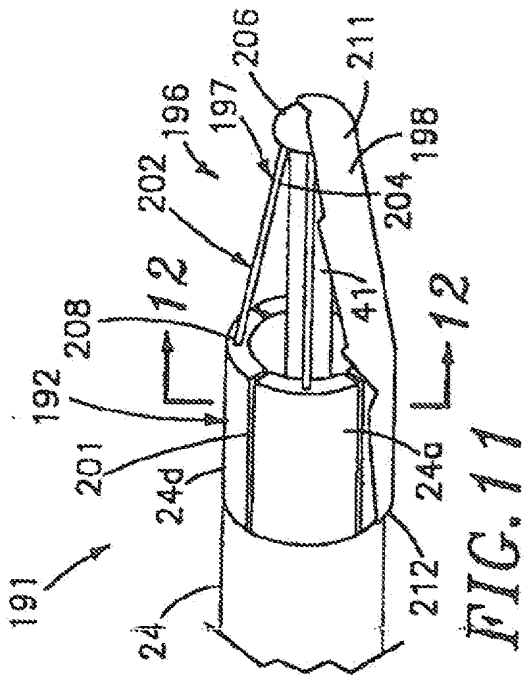

FIG. 11

[Drawing 12]

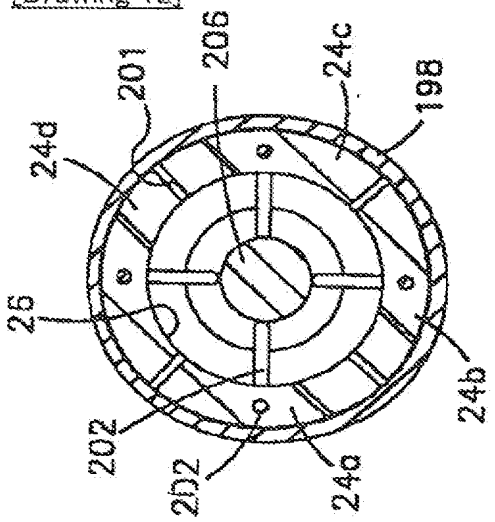

FIG. 12

[Drawing 13]

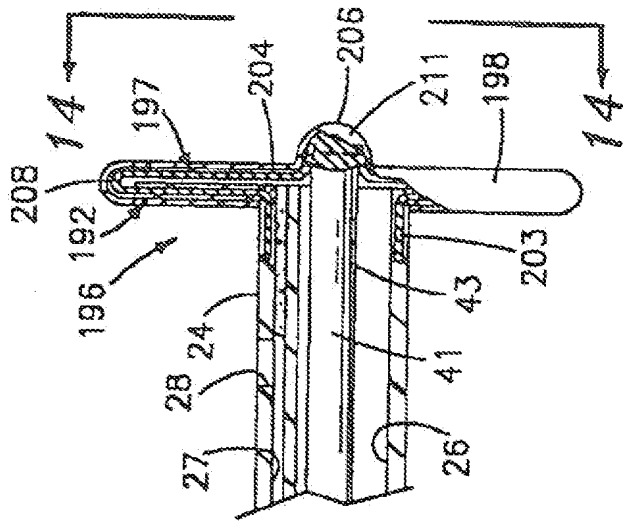

FIG. 13

[Drawing 14]

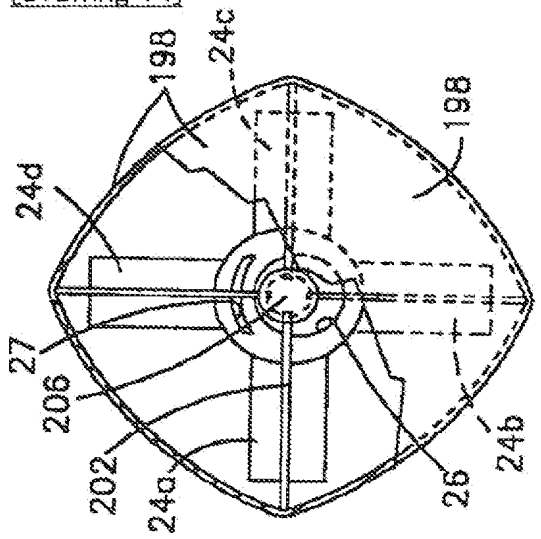

FIG. 14

[Drawing 15]

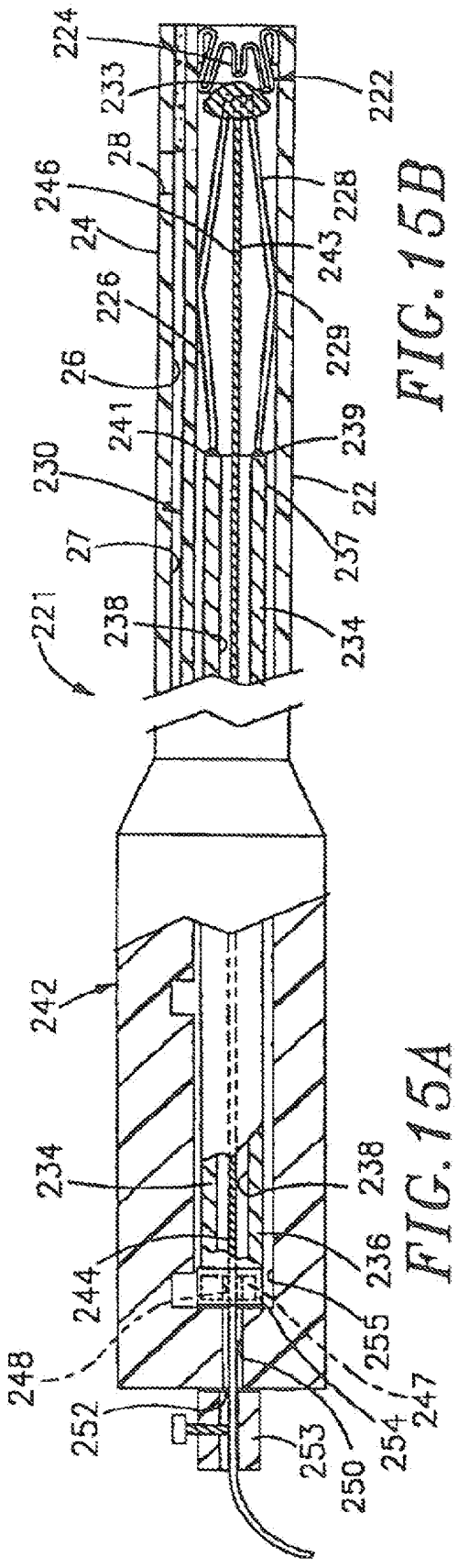

FIG. 15B

FIG. 15A

[Drawing 16]

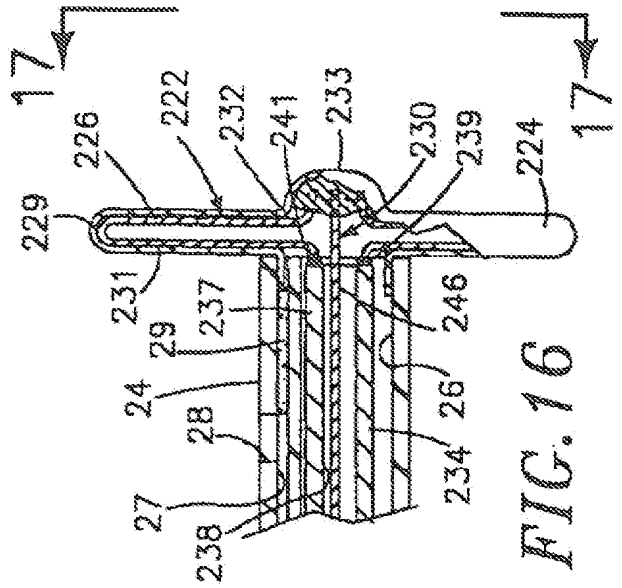

FIG. 16

[Drawing 17]

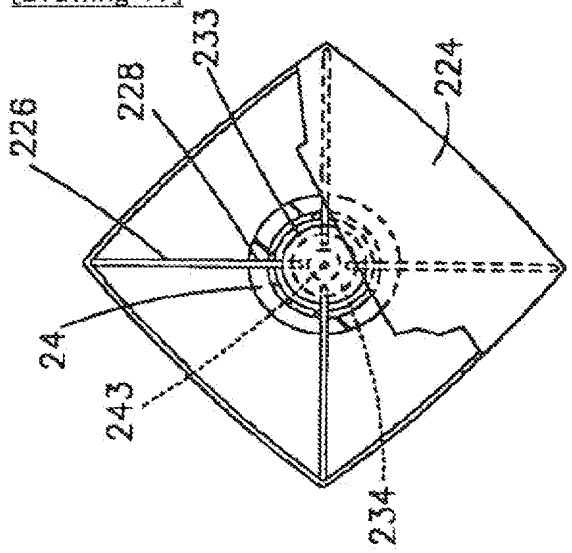

FIG. 17

[Drawing 18]

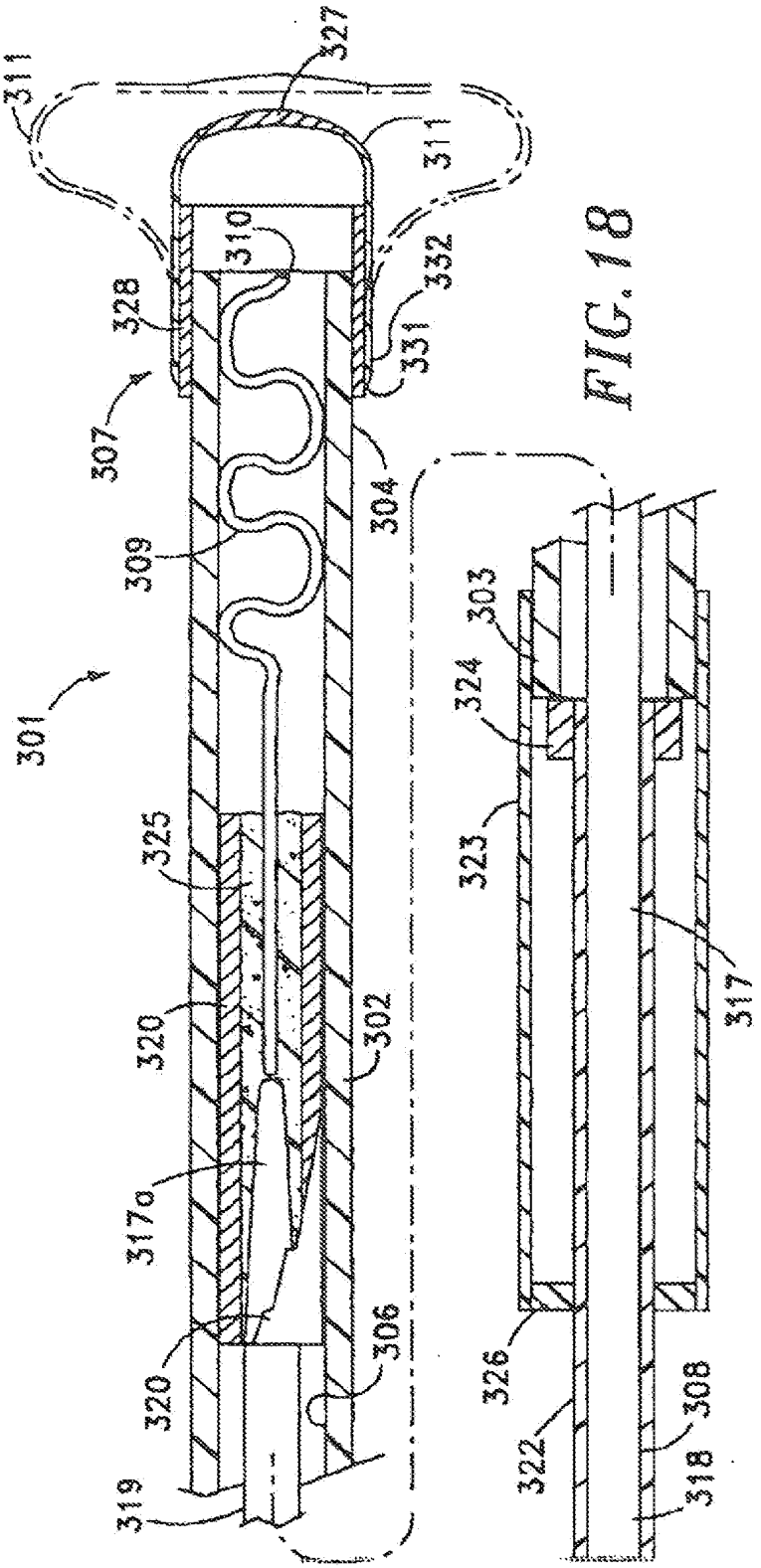

FIG. 18

[Drawing 19]

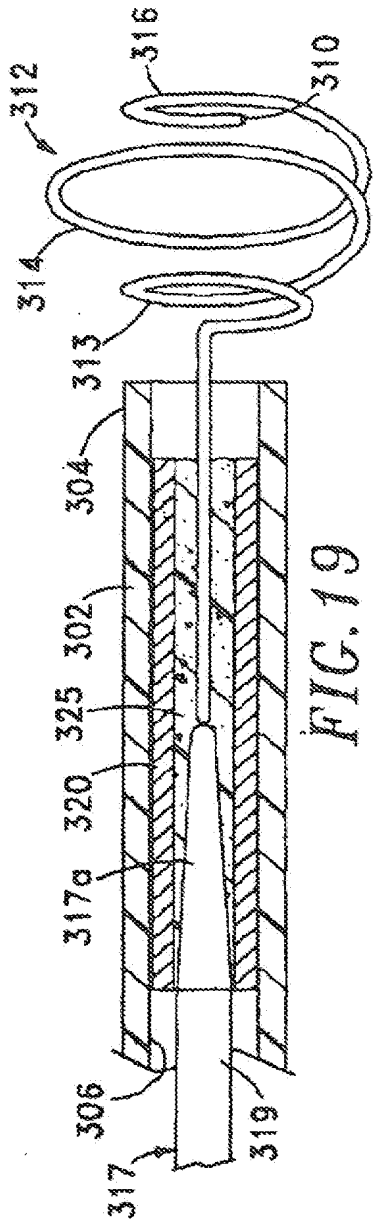

FIG. 19

[Drawing 20]

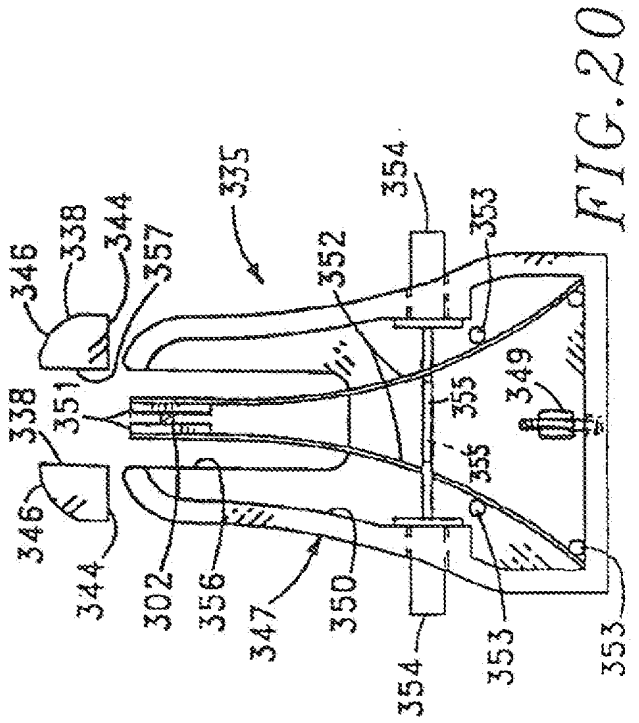

FIG. 20

[Drawing 21]

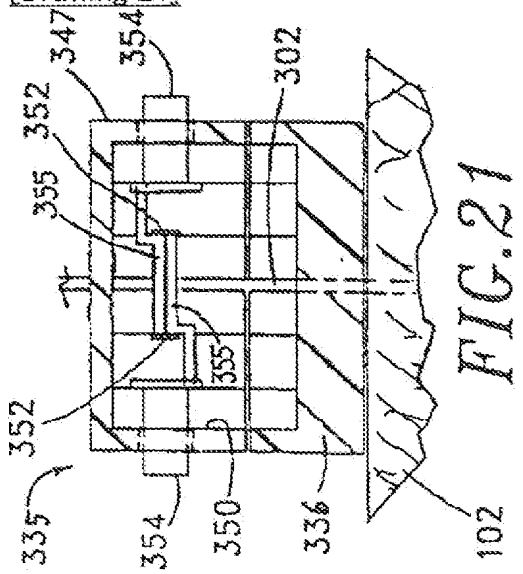

FIG. 21

[Drawing 22]

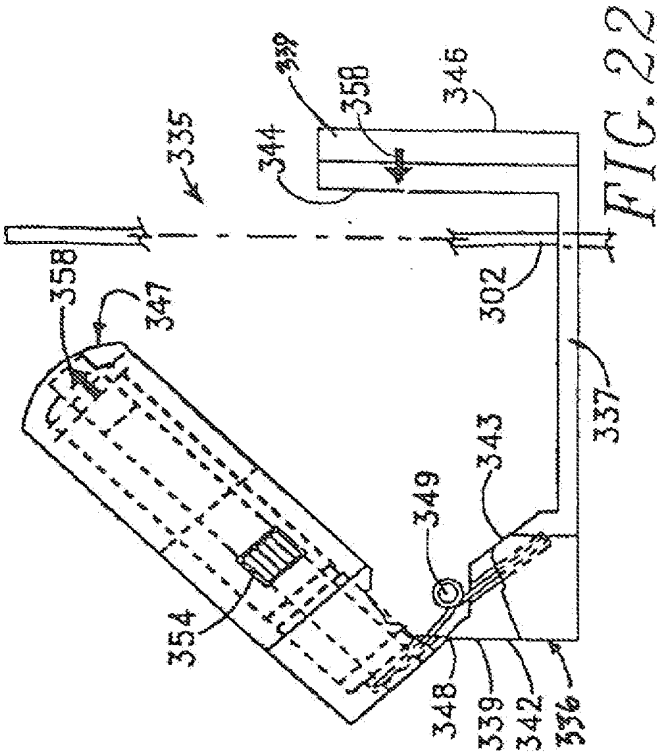

FIG. 22

[Drawing 23]

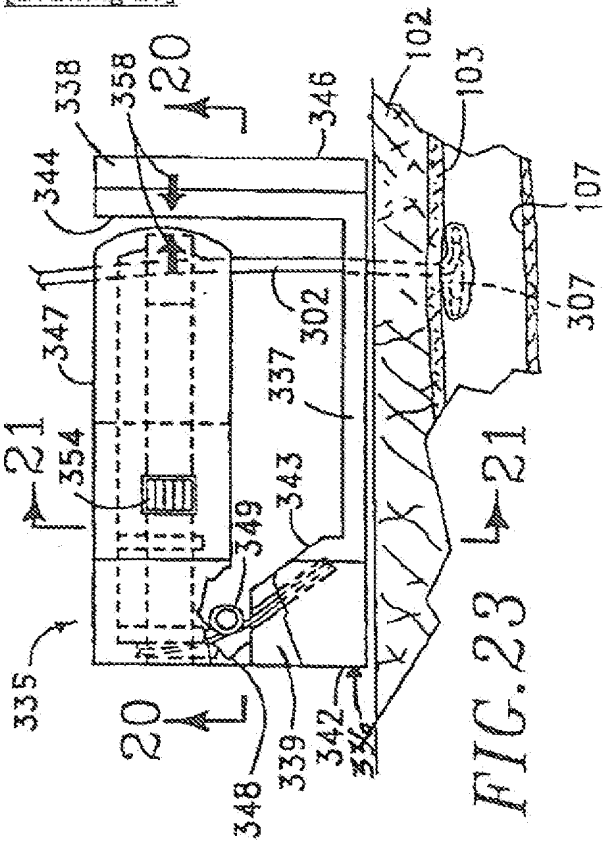

FIG. 23

[Drawing 24]

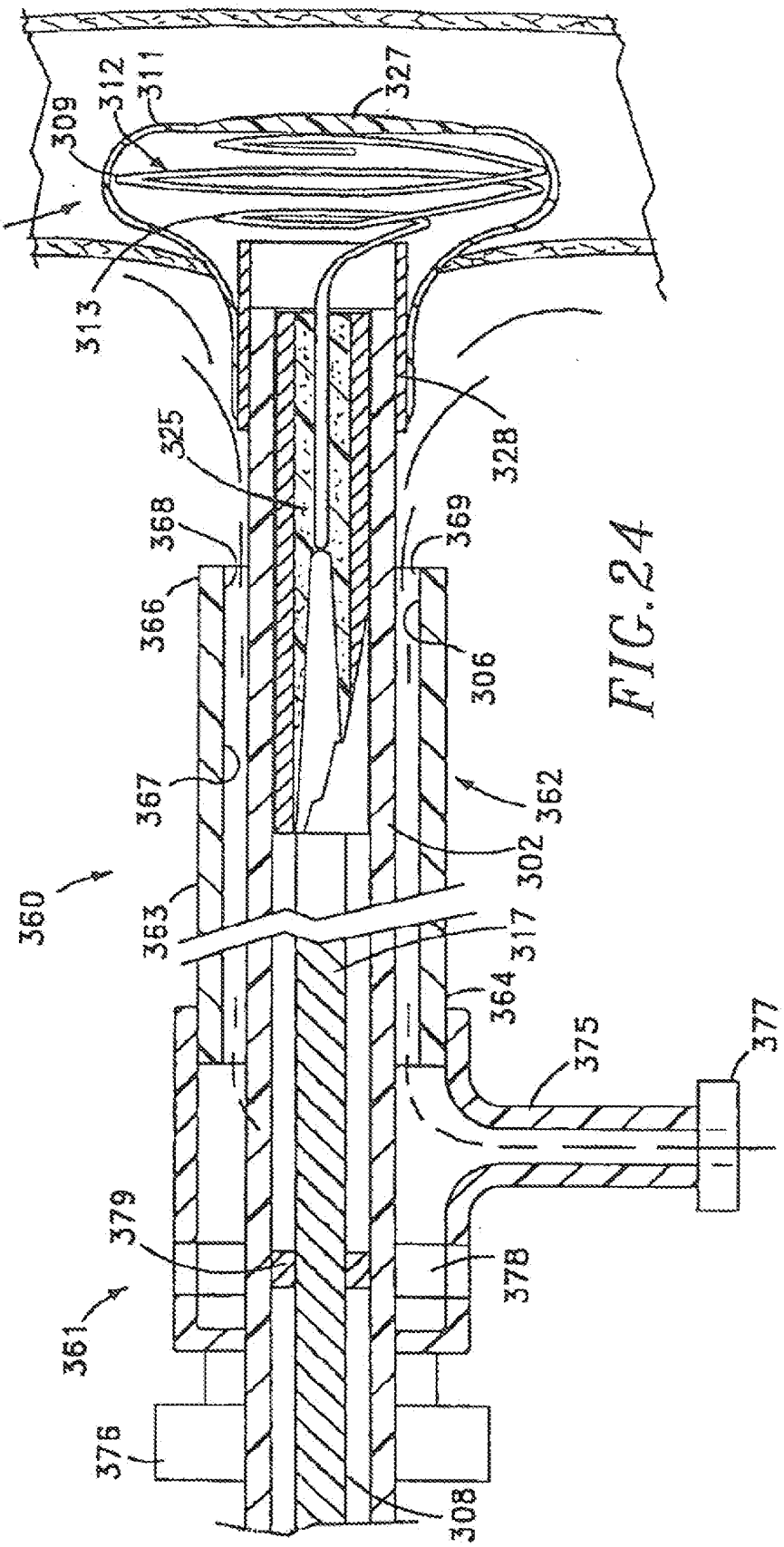

FIG. 24

[Drawing 25]

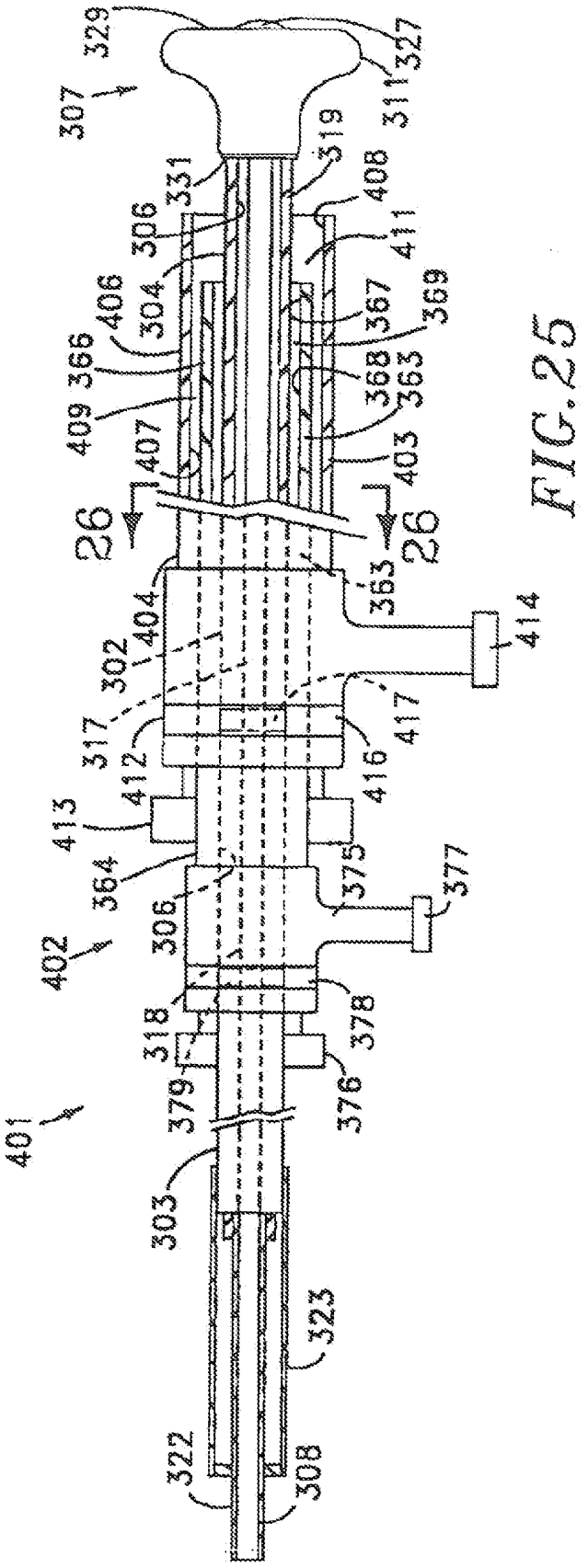

FIG. 25

[Drawing 26]

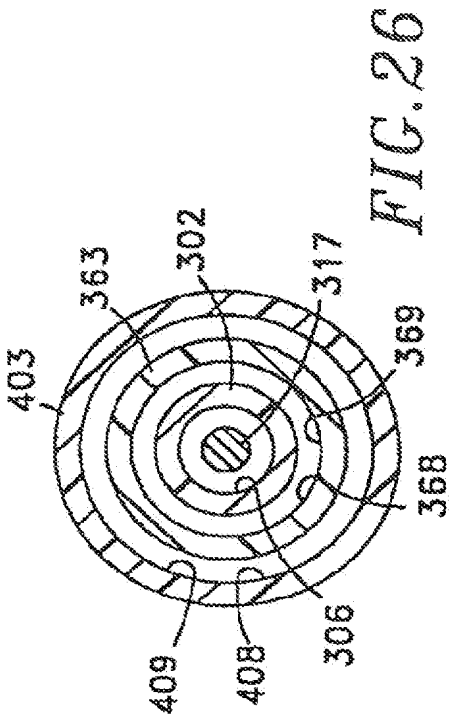

FIG. 26

[Drawing 27]

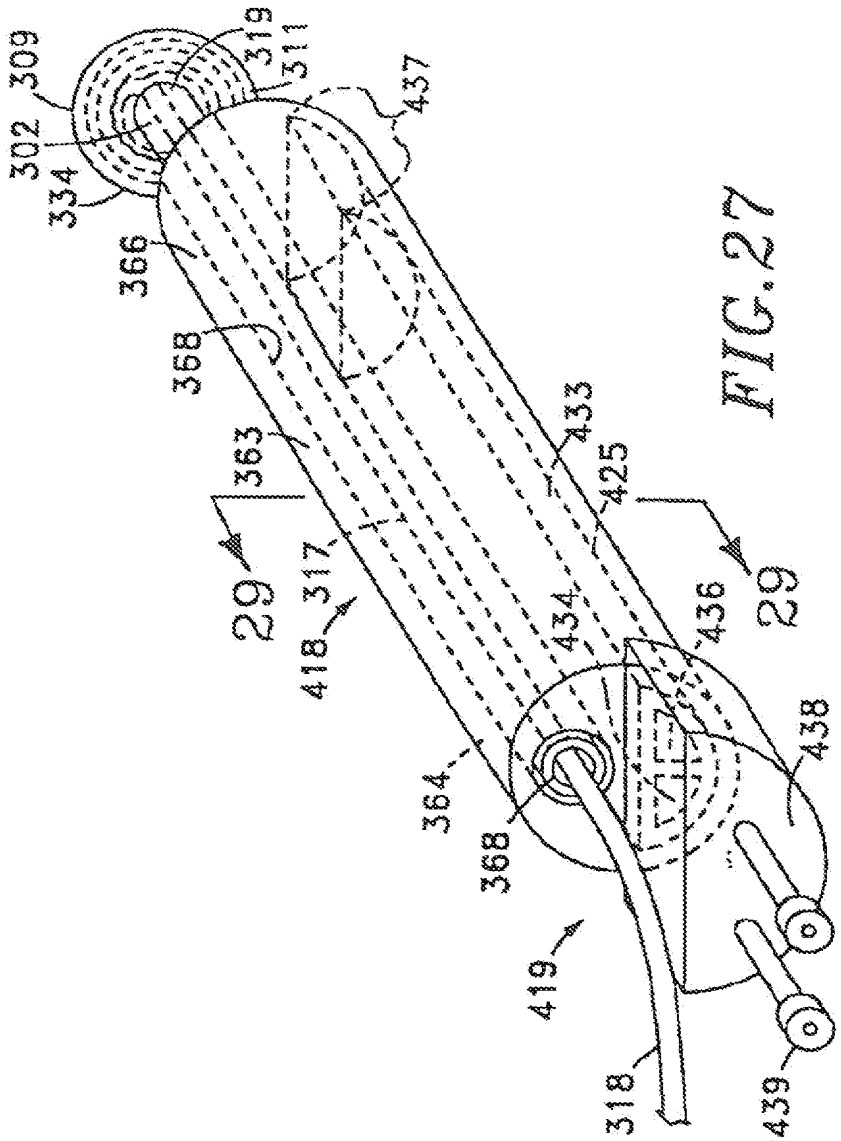

FIG. 27

[Drawing 28]

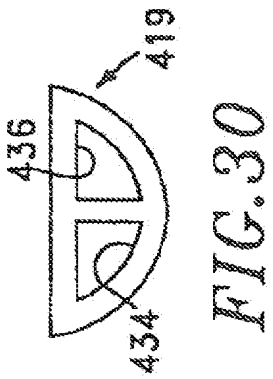

FIG. 30

[Drawing 31]

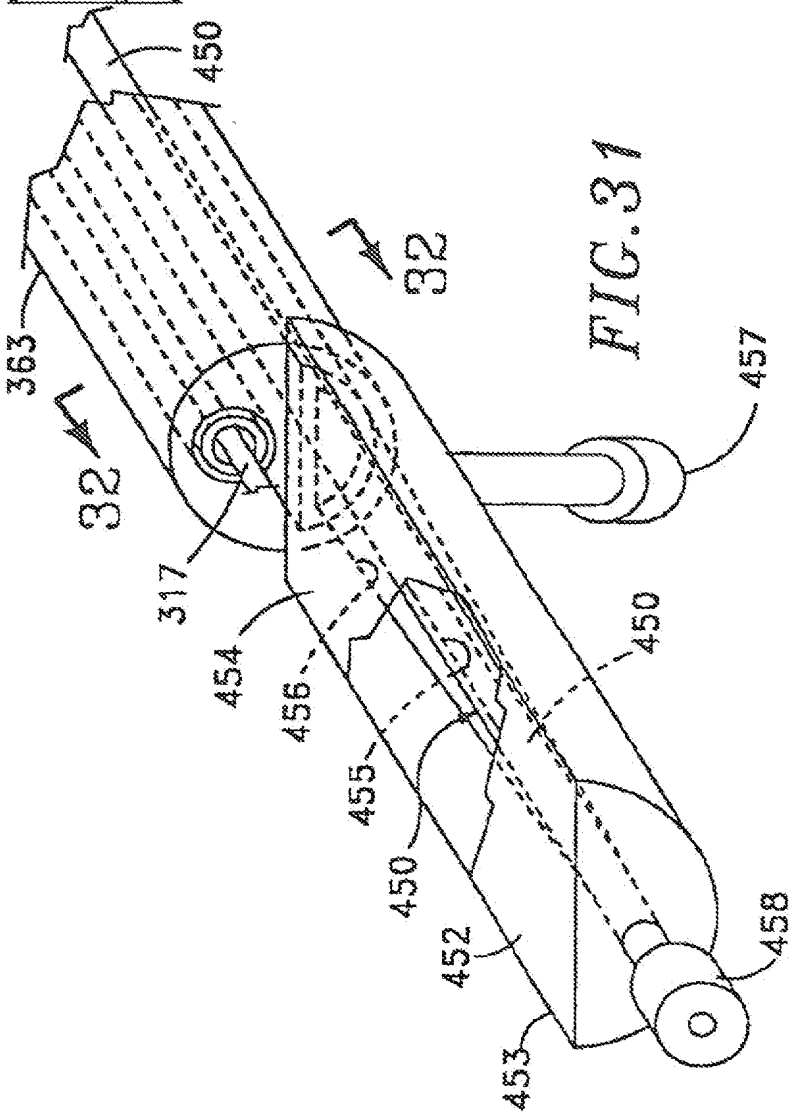

FIG. 31

[Drawing 32]

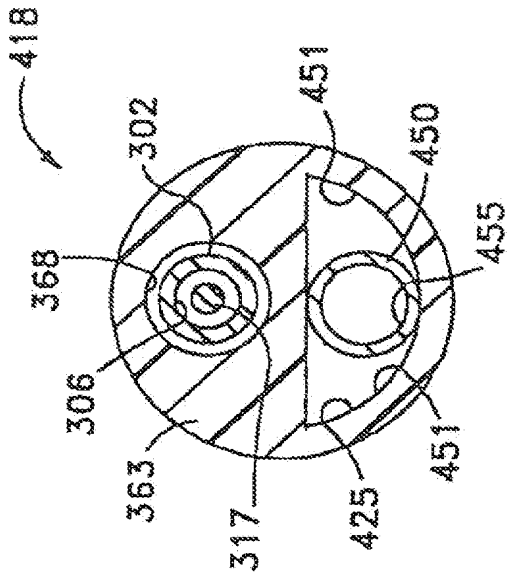

FIG. 32

[Translation done.]

* NOTICES *

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3.In the drawings, any words are not translated.

WRITTEN AMENDMENT

[Written Amendment]
[Filing date]Heisei 11(1999) August 12 (1999.8.12)
[Proposed Amendment]
CLAIMS
1. In the growth equipment in a blood vessel with the wall which forms a lumen in the living body, they are a proximal edge and a distal end.
And distance of the 1st elongated tube-like member provided with the longitudinal direction axis, and this 1st elongated tube-like member
The extension member and **** which are supported by the end and can move between contraction shape and extended shape
It carries out, and has a wrap deformable film for at least a part of extension member, and this deformable film is **.
It has the size which can be extended when a tension member moves to extended shape from contraction shape,
The disposition means which was supported by the proximal edge of the 1st elongated tube-like member, and was connected with the extension member
Having, this disposition means moves an extension member between contraction shape and extended shape.
Growth equipment, wherein things are made.
2. Said extension member becomes an essential target with a free state from a hyperelastic material, and is this hyperelastic material.
In ** and a free state, they are an even coil, a helical coil, and two or more strikes substantially.
Substantially complicated geometry chosen from the group which consists of a rat and a flower
Growth equipment given in the 1st ****(ing) paragraph of Claim.
3. The shape of said free state has larger size than the extended shape of an extension member.

Growth equipment given in the 2nd paragraph of Claim by which it is characterized.
4. Said deformable film permits movement of the extension member within this film, and is contraction shape ****.
It is from the shape of a free state to said small extended shape about an extension member during movement between the shape of dildoe.
Growth equipment given in the 3rd restraining paragraph of Claim.
5. The shape of said free state is not substantially even, and extended shape is substantially even.
Growth equipment given in the 2nd paragraph of Claim characterized by things.
6. the 1st layer to which said deformable film is located under an extension member in extended shape --- and
It has size extensible so that it may have the 2nd layer located upwards.
Growth equipment given in the 1st paragraph of Claim.
7. ** in which said deformable film has disk-like shape substantially in extended shape
Growth equipment given in the 6th paragraph of Claim characterized by **.

8. ****** of claim, wherein said flexible member has SOx-like shape
Growth equipment given in the 7th paragraph.
9. Said disposition means is prolonged from a proximal edge, a distal end, and the proximal edge to the distal end.
It is arranged in the elongated tube-like member provided with the tubular pore, and said tubular pore, and is fixed to an extension member.
Having a ** bushing pull means, this bushing pull means is a proximal edge of an elongated tube-like member.
Growth equipment given in the 1st paragraph of Claim being able to access.
10. Said deformable film is [the open end part surrounded by the closed end and the rim and] ** about a rim.
Having a means to fix to the distal end of a 1 elongated-tube-like member, a deformable film is contraction shape.
Movement of the extension member within a film is enabled during movement between extended shape, and it is an extension member.
****** of the claim currently forming so that it may restrain in the extended shape
Growth equipment given in the 9th paragraph.
11. Said disposition means is prolonged from a proximal edge, a distal end, and the proximal edge to the distal end.
It is a juxtaposition side of the 1st elongated tube-like member provided with the tubular pore, and an extension member, and is outside the lumen of a blood vessel.
It connects with the 1st elongated tube-like member for introducing biological sealant in the body in a part.
Having the introduction means carried out, these introduction means are a proximal edge, a distal end, and a longitudinal direction axis.
Having the 2nd elongated tube-like member provided with the line, this 2nd elongated tube-like member is a proximal edge of this member.
It has a wall which forms the tubular pore prolonged to ** distal ends, and is before a 2nd elongated tube-like member.
An account tubular pore has a larger diameter than the outer diameter of a 1st elongated tube-like member, and is a 1st elongated tube-like member.
It is arranged in the tubular pore of a 2nd elongated tube-like member, and, thereby, they are a 1st elongated tube-like member and the 2nd **.
Forming space between the walls of a long-pipe-shape member, the distal end of a 2nd elongated tube-like member is the 1st.
From the distal end of an elongated tube-like member, it is a juxtaposition side and the termination is adjacently carried out to the extension member.
Growth equipment given in the 1st paragraph of Claim by which it is characterized.
12. Said biological sealant is the fibrin glue, Koller Ken, and Avitene (quotient).
The mark, cellulose, gelatin, Jelfoam (trademark), thrombin, fibrin,
The example of the claim choosing from the group which consists of thrombin collagen
Growth equipment given in the 11th paragraph of an enclosure.
13. In the device extended within a blood vessel with the wall which forms a lumen in the living body, it is a proximal edge,
Having the elongated tube-like main part provided with the distal end and the longitudinal direction axis, this elongated tube-like main part is **.
It is alike, and has a 1st, 2nd, and 3rd elongated tube-like member, and each elongated tube-like member is a proximal edge,
A distal end, a longitudinal direction axis, and a wall are formed, and it is from the proximal edge of each elongated tube-like member.
Having the tubular pore prolonged to the distal end, a 1st elongated tube-like member is a 2nd elongated tube-like member.
It has a diameter of the size arranged in a tubular pore, and, thereby, is a 1st elongated tube-like member and the 2nd.

Forming the 1st space between elongated tube-like members, a 2nd elongated tube-like member is the shape of 3rd elongated tube.
It has a diameter of the size arranged in the tubular pore of a member, and, thereby, is a 2nd elongated tube-like member.
The 2nd space is formed between 3rd elongated tube-like members, and it is a distal end of an elongated tube-like main part.
The extension member which is supported and can move between contraction shape and extended shape, and an elongated tube-like book
It has the deformable film supported with the body, and set this deformable film in extended shape.
It has the 2nd layer located on the 1st layer located under an extension member, and an extension member.
having size extensible for obtaining and being supported by the proximal edge of an elongated tube-like main part -- and contraction
** which can be operated by people's hand since movement of the extension member between shape and extended shape is controlled
A device extended within the blood vessel having ****** further.

[Translation done.]